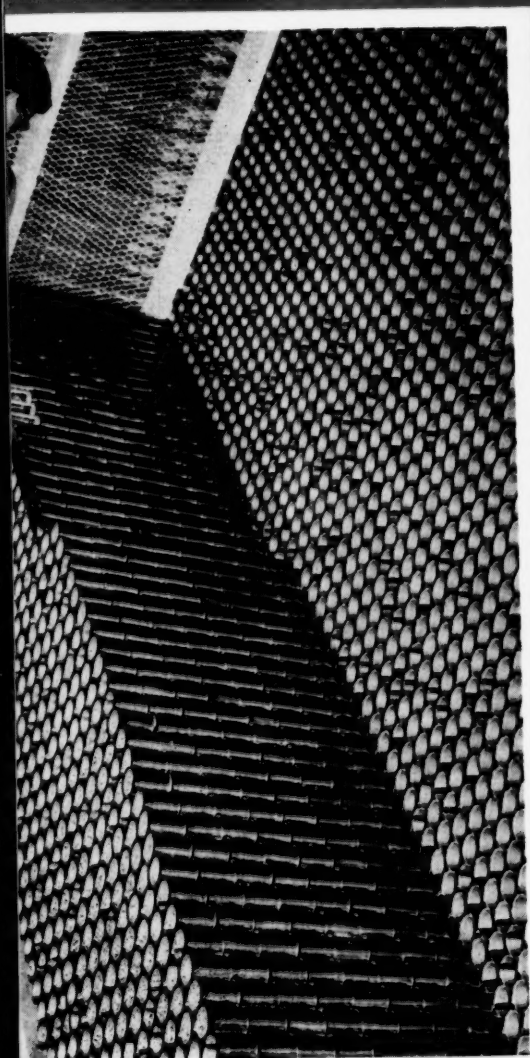


# Chemical Week

November 2, 1957

Price 35 cents



Last week's big stock-price dip:  
Does it change process industries'  
business outlook? . . . . . p. 21

Sure, research directors' salaries  
are rising. But administrative load  
is rising too . . . . . p. 30

Money-saving materials handling.  
New system pairs straddle carriers,  
maximum palletization . . p. 34

Oversupply of sequestrants is  
implied in federal figures. "Utter  
nonsense," say producers . p. 65

◆ Aluminum cans begin showdown  
for slice of a \$1.8-billion/year  
container market . . . . . p. 75



**NOW!**  
**In Quick-Dissolving**  
**Non-Caking**  
**FLAKES**

**SOLVAY ANHYDROUS U.S.P.**  
**FLAKE**  
**SODIUM NITRITE**

Now available at no increase in price—anhydrous U.S.P. sodium nitrite in an exclusive time and labor saving *flake* form! For the first time you can get anhydrous sodium nitrite that will dissolve rapidly, as well as store without caking. This new SOLVAY product is now packed in 400-lb. fiber drums as well as 100- and 400-lb. steel drums and 100-lb. bags to meet your individual needs.

Write, or fill in coupon, for prices and the name of your nearest dealer.

**Inspection Sample Available—  
 Check Coupon Below**

Sodium Nitrite • Caustic Soda • Calcium Chloride  
 Chlorine • Caustic Potash • Potassium Carbonate  
 Sodium Bicarbonate • Chloroform • Vinyl Chloride  
 Methyl Chloride • Ammonium Chloride • Methylene  
 Chloride • Cleaning Compounds • Hydrogen Peroxide  
 Ammonium Bicarbonate • Aluminum Chloride • Carbon  
 Tetrachloride • Monochlorobenzene • Para-dichlorobenzene  
 Ortho-dichlorobenzene • Soda Ash • Snowflake® Crystals



**SOLVAY PROCESS DIVISION**  
**ALLIED CHEMICAL & DYE CORPORATION**  
 61 Broadway, New York 6, N. Y.

Please send me:

- ☐ Inspection sample of SOLVAY flake Sodium Nitrite.  
☐ Prices and the name of my nearest dealer.

Name \_\_\_\_\_

Position \_\_\_\_\_

Company \_\_\_\_\_

Phone \_\_\_\_\_

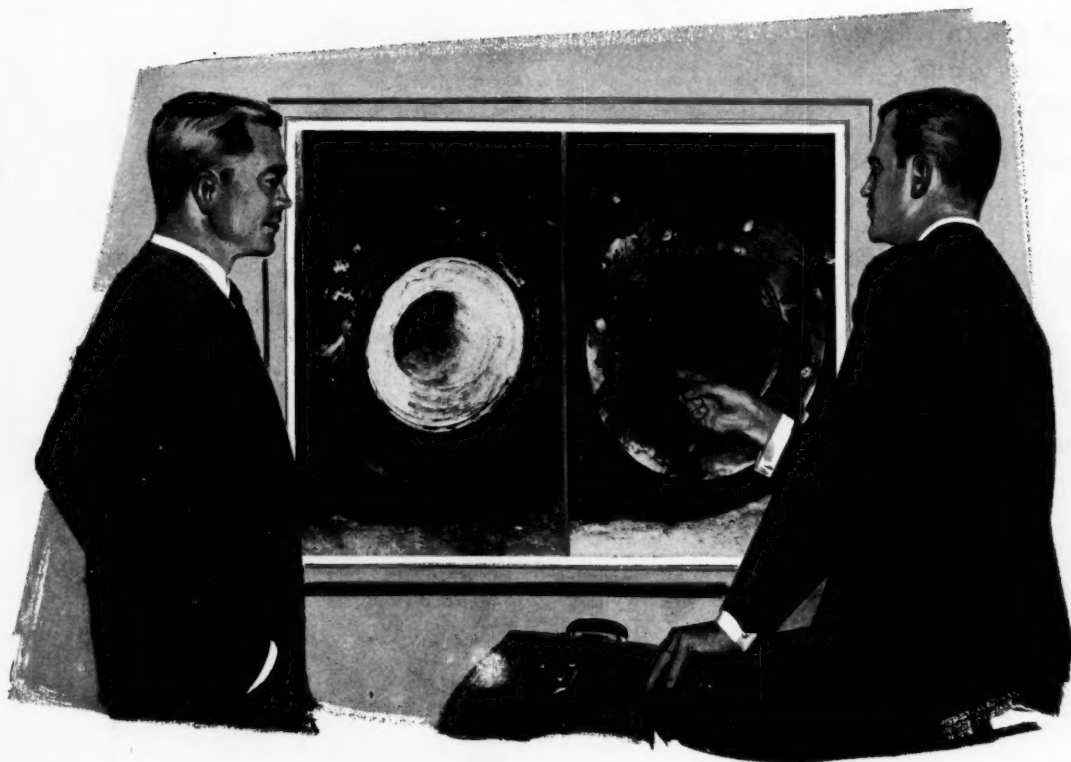
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DP-11



***here's how Dowell chemical cleaning saved \$71,000  
and helped protect a plant profit!***



A few months before their peak season, the operators of this plant decided their main water line might not supply the water necessary to meet peak demands.

The line was cast-iron, 16-inches in diameter and over 7,000 feet long. Its original flow efficiency or "C" factor had been 105; scale build-up had reduced this to 72. To lay an auxiliary line would cost at least \$85,000.

Dowell contracted to clean the pipe chemically for a little less than \$14,000, and to restore a minimum of 50 per cent of the line's lost capacity.

This Dowell did, and more—increasing the "C" factor to 92! Enough water was immediately available for capacity operation. This saved the plant \$71,000 and helped protect the company's annual profit.

The operating credit realized by this food processing plant, as a result of Dowell service, is similar to those realized by other Dowell customers—in the steel, paper, chemical, oil refining, power and allied industries.

Dowell engineers are experts in the use of solvents to remove scale and sludge—deposits that cut the throughput of product, process and steam generating systems. Dowell does the job, furnishing all chemicals, trained personnel, pumping and control equipment.

For specific information on how chemical cleaning can help you to greater profits, call the Dowell office nearest you. Or write Dowell Incorporated, Tulsa 1, Oklahoma.



***Have Dowell clean it chemically***



**A SERVICE SUBSIDIARY OF THE DOW CHEMICAL COMPANY**





## AMOCO CHEMICALS—A NEW RESOURCE

How good do you  
plan to make your  
insecticides next year?

### Consider these PANASOL Solvents

If you plan to make quality insecticides competitively priced in 1958, before you sign contracts for solvents learn more about PANASOL Solvents AN-1 and AN-3. Here are two clear, pale-color, aromatic hydrocarbon solvents offered especially for insecticide formulating.

#### Typical Properties

PANASOL	AN-1	AN-3
Distillation, °F., ASTM D158		
IBP, °F.	396	446
FBP, °F.	490	540
Specific Gravity, 60/60° F.	0.961	0.995
Aromatics, Vol. %	95	99
Mixed Aniline Point, °F.	62	52
Flash Point, COC., °F.	190	235
Copper Strip Corrosion	Pass	Pass

#### Solubility\*

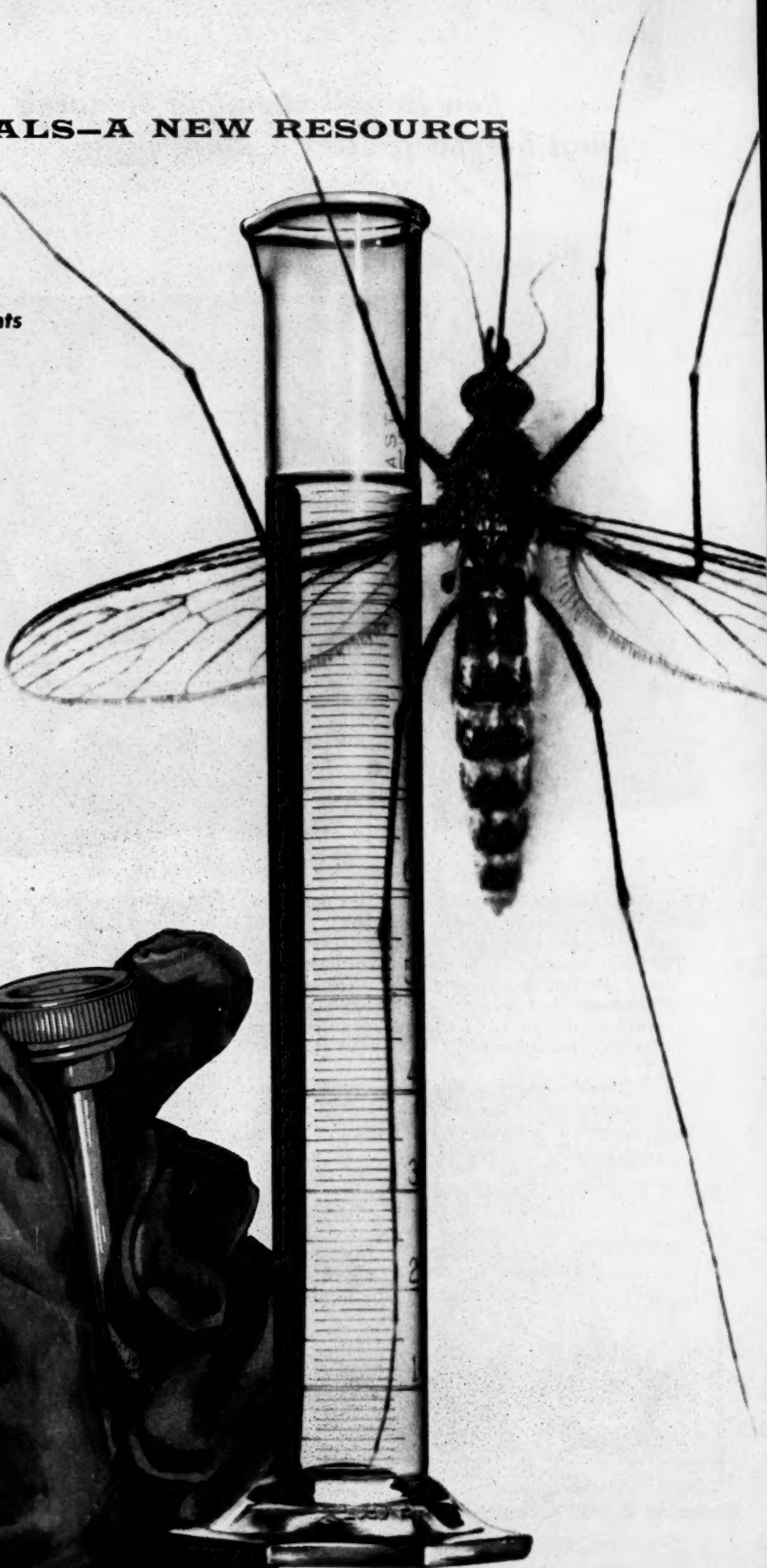
	AN-1	AN-3
DDT (tech.)	39	43
BHC (tech.)	29	31
Lindane	9	14
Dieldrin	26	27

\*Wt. parts in 100 parts solution at 32° F.

Your request for prices, samples and shipping information will receive immediate attention.

**AMOCO**  
CHEMICALS  
CORPORATION

910 S. Michigan Ave.  
Chicago 80, Ill.





- ▶ **Are management courses valuable to process-industry firms?**  
Attendance at AMA seminars indicates they are ....p. 38
- ▶ **Nuclear industry's demands for process engineers** will double in five-year period. This may pose a problem for chemical process firms .....p. 54
- ▶ **Cyanamid's new alkyd resin emulsion for use in paints** will compete with latex, vinyl and acrylic formulations for interior use .....p. 83

## 15 OPINION

## 15 MEETINGS

## 17 BUSINESS NEWSLETTER

21 Management worries about price gyrations on stock market, but sees the declines of past few months as more of a problem.

22 International Minerals takes look ahead, sees its Canadian potash operations as profitmaker.

New question on British atom scare: Were hydrogen-bomb components being tested in runaway reactor?

23 AEC cancels National Lead's contract to operate uranium-processing plant at Grand Junction.

Antitrust policy will remain unchanged, as Justice Dept. gets new chief.

Army unveils its portable oxygen-making unit.

## 27 WASHINGTON NEWSLETTER

## 30 RESEARCH

Here's the word on how far research directors' salaries and budgets have gone up.

32 Novel steel bar can be magnetized in four directions.

## 34 PRODUCTION

Carbide adapts palletizing tech-

niques to the handling of maintenance items and construction materials.

## 38 ADMINISTRATION

New advanced management training center in New York's Adirondack State Park draws large contingents from chemical concerns.

## 54 ENGINEERING

Other industries will compete more strongly for process-industry-oriented engineers.

## 61 TECHNOLOGY NEWSLETTER

## 65 MARKETS

Makers of sequestering agents admit "temporary" overcapacity, but dispute reports of big oversupply.

## 71 MARKET NEWSLETTER

## 75 SALES

Kaiser joins Reynolds in touting aluminum cans as replacement for tin-plate containers.

## 83 SPECIALTIES

American Cyanamid unveils new alkyd emulsion for use in water-base paints.

84 Porelon—a material that gives off liquids at controlled rates—may find application in several specialty fields.

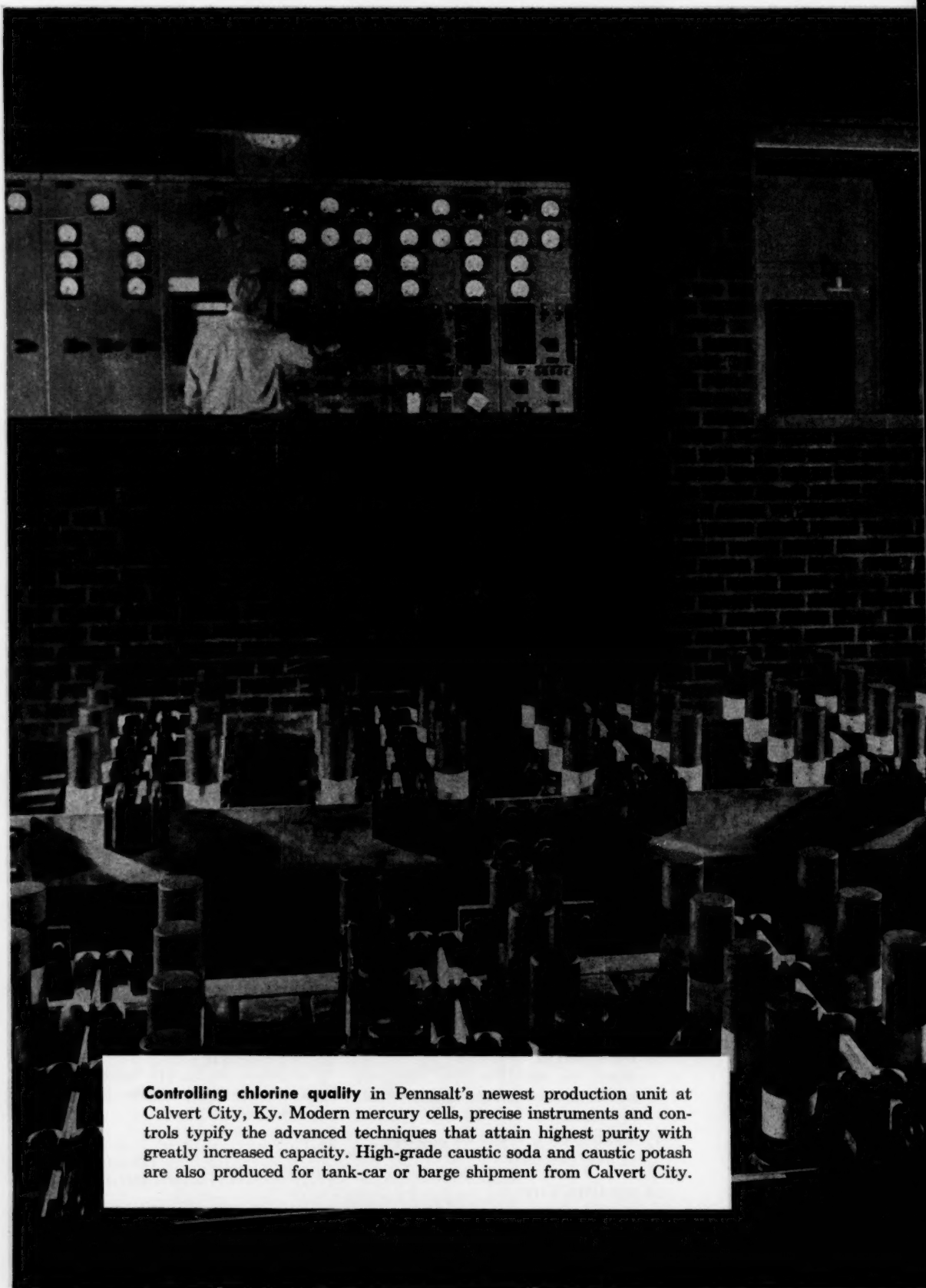
## 88 CHARTING BUSINESS

Vol. 81  
No. 18

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N.Y. Printed in U.S.A. Second-class mail privileges authorized at Philadelphia, Pa. © Copyright 1957 by McGraw-Hill Publishing Co., Inc. All rights reserved. Subscription: \$3/year in U.S.A., U.S. Possessions; \$4, Canada; \$15, other Western Hemisphere countries; \$25, all other countries. Also see p. 12.

Watch CW Grow — 39,383 copies of this issue printed





**Controlling chlorine quality** in Pennsalt's newest production unit at Calvert City, Ky. Modern mercury cells, precise instruments and controls typify the advanced techniques that attain highest purity with greatly increased capacity. High-grade caustic soda and caustic potash are also produced for tank-car or barge shipment from Calvert City.



*News for chlorine users*

# **Now . . . . EXPANDED CAPACITY**

## **backed by Pennsalt's**

## **48 years in chlorine**

Our newest chlorine facilities at Calvert City, Ky. . . . now in operation . . . apply the most modern methods of production and quality control. This assures users a plentiful supply, at maximum purity, to meet or better their needs.

Backing Pennsalt's high capacity is nearly a half-century of specialized chlorine transportation experience. Shipments have been continuous . . . ever since the first successful American rail shipment of chlorine in single-unit tank cars was made in 1909 by Pennsalt. You get the same dependable service if you prefer chlorine in multiple-unit tank cars or cylinders.

Chlorine is one of over 400 quality chemicals for industry made by Pennsalt. Write to us for fast information and expert assistance on your applications.

Write for your copy of Chlorine Bulletin H-576, containing valuable data on properties, containers, piping, fixtures and handling.



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Chemicals**

**INDUSTRIAL DIVISION  
PENNSALT CHEMICALS  
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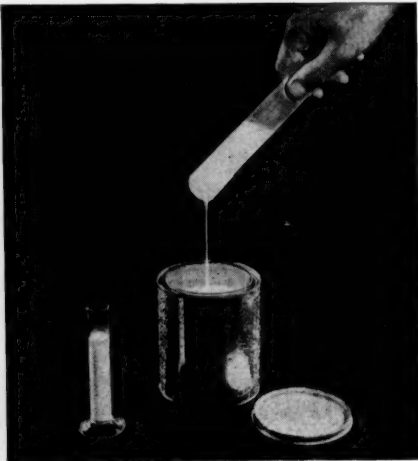
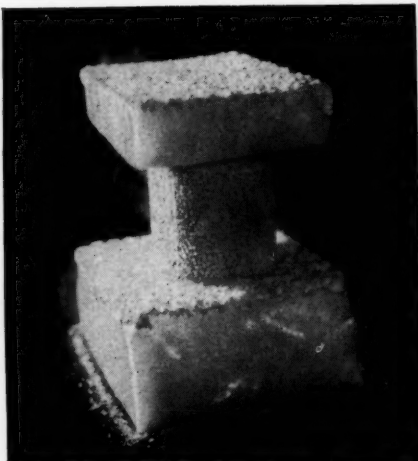
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Philadelphia • Pittsburgh • St. Louis

Representatives: Airco Co. International, New York  
Pennsalt Chemicals of Canada Ltd., Hamilton, Ontario



# Life on the Chemical Newsfront

**FIFTY PUREBRED HEIFERS** are offered in a current Cyanamid program to help improve the nation's dairy herds. Any dairy farmer can participate and if he is one of the winners he will receive a calf of his own breed choice. The program, which ends January 31, 1958, is part of a promotion for **AUREOMYCIN® chlortetracycline** mastitis treatment—an important factor in maintaining dairy herd health. This is one of many chemicals and drugs offered for farm and home use by Cyanamid's recently formed Farm and Home Division.

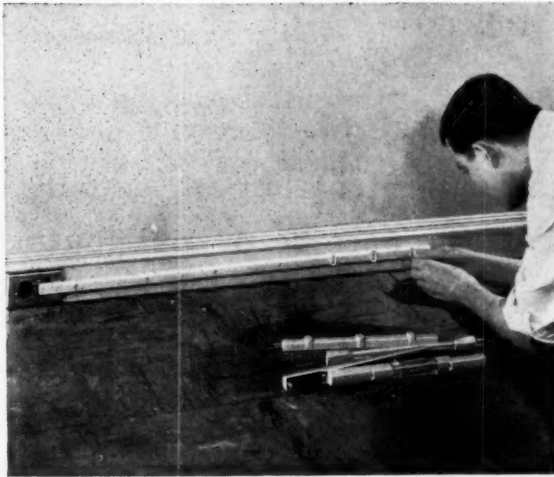


**FREEZE-THAW STABILITY IS ADDED** to vinyl latices prepared with **PAM polyacrylamide** as the protective colloid. A water-soluble polymer, PAM protects latex particle size and dispersion through multiple freeze-thaw cycles, keeps viscosity stable through a range of application conditions and provides excellent salt tolerance where required. The improved storage characteristics of dispersions stabilized with PAM will mean wider application possibilities for paints, adhesives and other vinyl latex products. (New Product Development Department, Dept. D)





**RED PIGMENTS NOW STAY RED** in vinyl floor tile in spite of exposure to acids, alkalis and harsh cleaning methods. The pigment is Clarion Red 20-7150, a vivid red "on the yellow side" that was particularly designed to withstand the attack of household chemicals. As a result, Clarion Red 20-7150 is finding application in a wide range of plastic products where bright permanent reds are called for. (Pigments Division)



**RELIEF FROM THE "WIRE JUNGLE"** is provided by the new Snapit Inter-Link system made by Cable Electric Products Inc. Molded of BEETLE® urea molding compound, these interlocking units provide low-cost, easily installed electrical outlets that have Underwriters Laboratories' approval and meet building codes. The strength and excellent insulating properties of BEETLE assure safe, dependable service. (Plastics and Resins Division)

**SOUR NAPHTHAS NOW YIELD HIGH-TEST GASOLINE** as hydrogen processing, with the aid of Cyanamid's new AERO® HDS-2 cobalt-molybdena catalysts, salvages high-sulfur stocks that can't be reformed directly. The sulfur, which poisons the platinum catalyst used in reforming, is effectively converted to hydrogen sulfide gas, which is easily removed, and the stock becomes ideal reformer feed in the production of high-octane fractions. Practical operating experience was combined with laboratory development in designing these HDS hydrogen desulfurization catalysts and they are now being produced at a new Cyanamid catalyst plant. (Industrial Chemicals Div., Dept. D)



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**CYANAMID**

AMERICAN CYANAMID COMPANY  
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

*Helping America Make Better Use of Its Resources*



*For further information on these and other chemicals, call, write or wire American Cyanamid Company*

**November 2, 1957 • Chemical Week**



**How chemical buyers benefit  
from the service of distributors**

## **Personal Service**

There's a man near you who's well worth knowing—your local distributor of Du Pont Methanol, Urea and other quality Du Pont chemicals. He offers you neighborly “personal” service you'll appreciate...and has the equipment and man power to fill your chemical needs promptly. Remember, your local Du Pont distributor takes a special interest in your firm, for he knows the value of a friendly business relationship.

**POLYCHEMICALS**



Wherever you are . . . there's  
a distributor of Du Pont Methanol,  
Urea, "Hexalin" Cyclohexanol,  
and "Hytrol" O Cyclohexanone  
ready to serve you.

Your Du Pont Distributor of Methanol and Urea represents many leading chemical companies . . . acting as a *single source* of supply for most—if not all—your chemical requirements. You can count on both quantity and quality from your distributor—to meet your most exacting specifications and with deliveries timed to your schedules. As a member of your community, he can serve you efficiently, because he's aware of local transportation and other situations in your area. And no one takes more of an interest in making you a satisfied customer.

Du Pont considers its distributors an extension of its own sales organization and selects them on their ability to provide the type of service that meets Du Pont's own high standards. Du Pont salesmen work closely with distributor salesmen—and assistance from Du Pont Technical Representatives is always available through your distributor.

You can be sure of uniform high quality when you order Du Pont Methanol, Urea and other proven Du Pont chemicals. Check the listing at right for the Du Pont Distributor nearest you.



BETTER THINGS FOR BETTER LIVING  
... THROUGH CHEMISTRY

## DEPARTMENT

November 2, 1957 • Chemical Week

### FOR METHANOL

<b>CALIFORNIA</b>	Los Angeles..... Braun Corporation
	San Francisco..... Braun-Knecht-Heimann Co.
<b>COLORADO</b>	Denver..... The Chemical Sales Co.
<b>FLORIDA</b>	Jacksonville..... Apperson Chemical, Inc.
	Miami..... Biscayne Chemical Labs, Inc.
	Orlando..... Lenfestey Supply Company
	Tampa..... Lenfestey Supply Company
<b>GEORGIA</b>	Atlanta..... Chemical Services, Inc.
<b>ILLINOIS</b>	Chicago..... Central Solvents & Chemicals Co.
	Chicago..... Phillips & Martin Co.
<b>INDIANA</b>	Fl. Wayne..... Hoosier Solvents & Chemicals Corp.
	Indianapolis..... Hoosier Solvents & Chemicals Corp.
<b>KANSAS</b>	Wichita..... Barada & Page, Inc.
<b>KENTUCKY</b>	Louisville..... Dixie Solvents & Chemicals Co.
<b>LOUISIANA</b>	New Orleans..... Southern Solvents & Chemicals Corp.
<b>MARYLAND</b>	Baltimore..... Leidy Chemicals Corp.
<b>MASSACHUSETTS</b>	Boston..... Howe & French, Inc.
<b>MICHIGAN</b>	Detroit..... Western Solvents & Chemicals Co.
	Grand Rapids..... Wolverine Solvents & Chemicals Co.
<b>MINNESOTA</b>	St. Paul..... Lyon Chemicals, Inc.
<b>MISSOURI</b>	Kansas City..... Barada & Page, Inc.
	Kansas City..... Missouri Solvents & Chemicals Co.
	St. Louis..... Missouri Solvents & Chemicals Co.
<b>METROPOLITAN NEW YORK</b>	Lyndhurst, N. J..... Stoney-Mueller, Inc.
<b>NEW YORK</b>	Binghamton..... Collier Chemicals, Inc.
	Buffalo..... Chemical Sales Corp.
	New York..... Stoney-Mueller, Inc.
	Rensselaer..... Eastern Chemicals, Inc.
	Rochester..... Chemical Sales Corp.
<b>NORTH CAROLINA</b>	Durham..... Cardinal Products, Inc.
<b>OHIO</b>	Cincinnati..... Amco Solvents & Chemicals Co.
	Cleveland..... Ohio Solvents & Chemicals Co.
	Toledo..... Toledo Solvents & Chemicals Co.
<b>OKLAHOMA</b>	Tulsa..... Ward Chemical & Supply Co.
<b>OREGON</b>	Portland..... Van Waters & Rogers, Inc.
<b>PENNSYLVANIA</b>	Pittsburgh..... Vitro Manufacturing Co.
<b>TENNESSEE</b>	Memphis..... Chapman Chemical Co.
<b>TEXAS</b>	Dallas..... Texas Solvents & Chemicals Co.
	Dallas..... Van Waters & Rogers, Inc.
	Houston..... Texas Solvents & Chemicals Co.
	Houston..... Van Waters & Rogers, Inc.
<b>UTAH</b>	Salt Lake City..... Braun-Knecht-Heimann Co.
	Salt Lake City..... Wasatch Chemical Co.
<b>WASHINGTON</b>	Seattle..... Van Waters & Rogers, Inc.
	Spokane..... Van Waters & Rogers, Inc.
<b>WISCONSIN</b>	Milwaukee..... Wisconsin Solvents & Chemicals Corp.

### FOR UREA

<b>ALABAMA</b>	Birmingham..... F. H. Ross & Co.
	Mobile..... F. H. Ross & Co.
<b>CALIFORNIA</b>	Los Angeles..... Braun Corporation
	San Francisco..... Braun-Knecht-Heimann Co.
<b>CONNECTICUT</b>	South Norwalk..... Merchants Chemical Co., Inc.
<b>FLORIDA</b>	Jacksonville..... F. H. Ross & Co.
<b>GEORGIA</b>	Atlanta..... F. H. Ross & Co.
	Columbus..... F. H. Ross & Co.
	Savannah..... F. H. Ross & Co.
<b>ILLINOIS</b>	Chicago..... Central Solvents & Chemicals Co.
<b>INDIANA</b>	Fl. Wayne..... Hoosier Solvents & Chemicals Corp.
	Indianapolis..... Hoosier Solvents & Chemicals Corp.

<b>KENTUCKY</b>	Louisville..... Merchants Chemical Co., Inc.
<b>LOUISIANA</b>	New Orleans..... Barada & Page, Inc.
<b>MARYLAND</b>	Baltimore..... Leidy Chemicals Corp.
<b>MASSACHUSETTS</b>	Fall River..... Borden & Remington Co.
	Stonham..... George Mann & Co., Inc.
	Worcester..... Chemical Sales & Service Co., Inc.
<b>MICHIGAN</b>	Detroit..... Eaton Chemical & Dyestuff Co.
<b>MINNESOTA</b>	Minneapolis..... Merchants Chemical Co., Inc.
<b>MISSISSIPPI</b>	Jackson..... F. H. Ross & Co.
<b>MISSOURI</b>	Kansas City..... Barada & Page, Inc.
	St. Louis..... Barada & Page, Inc.
	St. Louis..... Missouri Solvents & Chemicals Co.
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	Paterson..... Brown Chemical Co., Inc.
<b>NEW YORK</b>	Buffalo..... Chemical Sales Corp.
	Hicksville, Long Island..... National Oil & Supply Co.
	New York..... Merchants Chemical Co., Inc.
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	Greensboro..... F. H. Ross & Co.
	Raleigh..... F. H. Ross & Co.
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	Cleveland..... Ohio Solvents & Chemicals Co.
	Columbus..... Merchants Chemical Co., Inc.
<b>OREGON</b>	Portland..... Van Waters & Rogers, Inc.
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	Erie..... Western Penna. Chemical Co., Inc.
	Middletown (Harrisburg)..... Western Penna. Chemical Co., Inc.
	Philadelphia..... Pioneer Salt Co.
<b>RHODE ISLAND</b>	Providence..... Borden & Remington Co.
	Providence..... George Mann & Co., Inc.
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	Greenville..... F. H. Ross & Co.
<b>TENNESSEE</b>	Chattanooga..... Burkart-Schier Chemical Co.
	Knoxville..... Burkart-Schier Chemical Co.
	Knoxville..... F. H. Ross & Co.
	Nashville..... Burkart-Schier Chemical Co.
<b>TEXAS</b>	Dallas..... Van Waters & Rogers, Inc.
	Houston..... Van Waters & Rogers, Inc.
<b>UTAH</b>	Salt Lake City..... Braun-Knecht-Heimann Co.
<b>WASHINGTON</b>	Seattle..... Van Waters & Rogers, Inc.
<b>WISCONSIN</b>	Milwaukee..... Merchants Chemical Co., Inc.

### FOR "HEXALIN" & "HYTROL" O

<b>CALIFORNIA</b>	Los Angeles..... Braun Corporation
	Los Angeles..... Mefford Chemical Company
	San Francisco..... Braun-Knecht-Heimann Co.
<b>ILLINOIS</b>	Chicago..... Central Solvents & Chemicals Co.
<b>INDIANA</b>	Fort Wayne..... Hoosier Solvents & Chemicals Corp.
	Indianapolis..... Hoosier Solvents & Chemicals Corp.
<b>KENTUCKY</b>	Louisville..... Dixie Solvents & Chemicals Co.
<b>MASSACHUSETTS</b>	Boston..... Howe & French, Inc.
	Worcester..... Chemical Sales & Service Co., Inc.
<b>MICHIGAN</b>	Detroit..... Western Solvents & Chemicals Co.
<b>MISSOURI</b>	Kansas City..... Missouri Solvents & Chemicals Co.
	St. Louis..... Missouri Solvents & Chemicals Co.
<b>NEW JERSEY</b>	Newark..... C. P. Chemical Solvents, Inc.
<b>OHIO</b>	Cincinnati..... Amco Solvents & Chemicals Co.
	Cleveland..... Ohio Solvents & Chemicals Co.
	Toledo..... Toledo Solvents & Chemicals Co.
<b>TEXAS</b>	Dallas..... Texas Solvents & Chemicals Co.
	Houston..... Texas Solvents & Chemicals Co.
<b>WISCONSIN</b>	Milwaukee..... Wisconsin Solvents & Chemicals Corp.

\*Reg. U. S. Pat. Off.



... AND WHEN WE FOUND THE SITE WITH THE WATER WE NEEDED, IT DIDN'T HAVE THE MANPOWER WE WANTED, SO WE FOUND THE MANPOWER, BUT THE TAXES WERE TOO HIGH, SO WE FOUND ANOTHER LOCATION, BUT IT WAS TOO FAR FROM RAW MATERIALS...



*Prescription...*

### — consult N&W plant location specialists

The procedure in successful location of chemical plants is bringing together *at one place* all the requirements and advantages you want — not *most* of them, but *all* of them. You don't want to make any sacrifices or compromises with quality and quantity in good location factors.

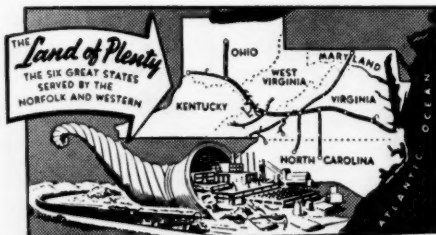
If you have the job of scouting plant sites for your company, we don't predict you'll wind up on the psychiatrist's couch — but if you go at it single-handed, we'll *guarantee* you'll run into an assortment of frustrations which will keep your morale from getting

too high and make the memory of the task linger on long after the plant is built!

Just as you go to your doctor for medical advice or your attorney for legal advice, come to the N&W's specialists for plant location advice. Get your problem off your mind with these experienced men. There's no bill or obligation whatsoever... your confidence will be respected... you'll get information promptly and reliably.

*Write, wire or call:*

L. E. Ward, Jr., Manager  
Industrial and Agricultural Dept.  
Drawer CW-787 (Phone Diamond 4-1451, Ext. 474)  
Norfolk and Western Railway  
Roanoke, Virginia



## Norfolk and Western RAILWAY



# NAUGATUCK Paracril

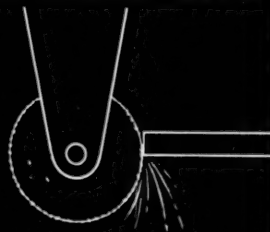
THE OIL-RESISTANT NITRILE RUBBER

MAXIMUM OIL RESISTANCE



EXCELLENT COLOR RETENTION

HIGH ABRASION RESISTANCE



*and now-*

**superior ozone resistance ● greatly increased flex life  
● even higher abrasion resistance**

The secret of obtaining these valuable new properties in the vulcanizate lies in a method—recently developed by Naugatuck research—of compounding PARACRIL® with other inexpensive materials. The additives modify and fortify the PARACRIL, greatly expanding its range of application. For example, in the manufacture of hose intended to carry or be used around oil or petroleum

distillates, PARACRIL can now be used to make long-lasting outer jackets and oil-resistant tubing.

The compounding secret that makes PARACRIL the ideal all-around oil-resistant rubber is available to PARACRIL users from Naugatuck's synthetic rubber and rubber chemicals technical representatives. Write or wire to have one of them call on you.



## Naugatuck Chemical

Division of United States Rubber Company, Naugatuck, Connecticut



CANADA: Naugatuck Chemicals Division, Dominion Rubber Co., Ltd., Elmira, Ontario • Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latexes • CABLE: Rubexport, N.Y.

November 2, 1957 • Chemical Week

11



## Custom production to fit your needs

The facilities and staff of Gamma Chemical Corporation are geared for the custom production of most synthetic organic chemicals. We have successfully produced for others such diverse products as tranquilizing drugs and rubber intermediates.

We are also prepared to act as your interim plant until such time as your own facilities are completed.

Plenty of room (80 acres)—few neighbors—not near enough for us to bother them—our own railroad siding—good labor.

Combine these advantages with the fact that we are small enough to move quickly, economically and efficiently, and we are sure that you will find it profitable to discuss your problems with us—in confidence, of course.

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**gamma**

**chemical corporation**

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**Fisher**

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NOVEMBER 2, 1957

VOL. 81, No. 18

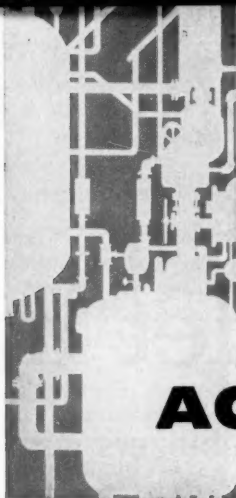
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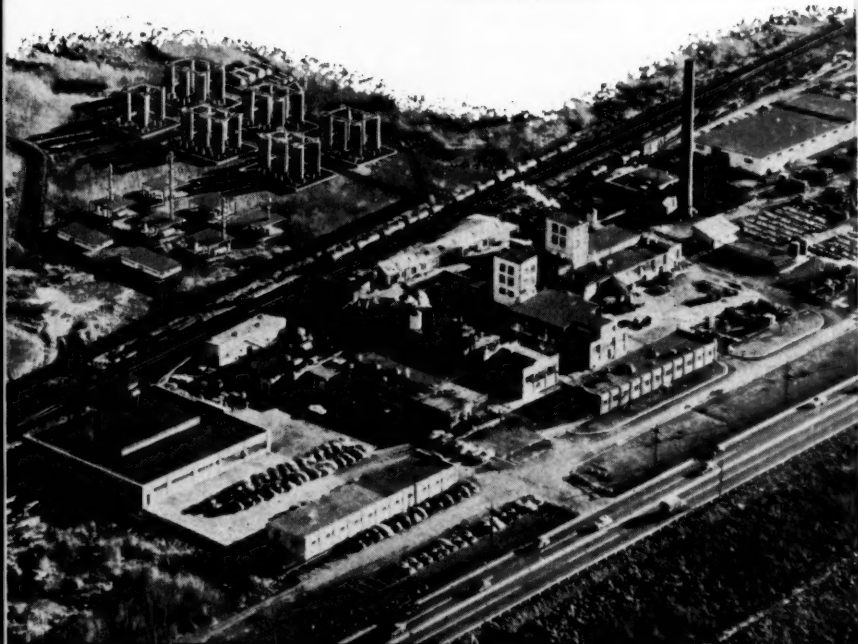


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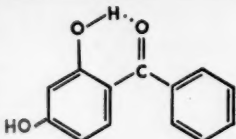
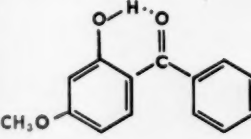
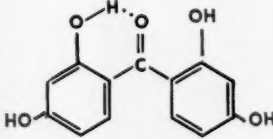
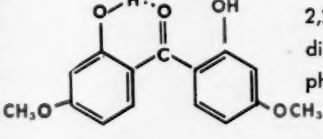
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## OPINION

### For Negro Employees

TO THE EDITOR: Permit me to compliment you on the excellent illustrated articles (Sept. 21) on "Beauty Begets a Million-Dollar Business" and "Selling the Negro Market."

Not only do these very interesting articles tell an important story of value to various industrial concerns, but they also indicate the tremendous potential in sales to thoughtful and considerate businessmen.

They should also give interested persons, especially in management, the thought that qualified Negro personnel, especially salesmen and technical people of the Negro race, should be given opportunity for employment, which also should enhance their possibilities in this market as well as doing a comparable job for all of their customers.

Further articles of this type from time to time would also be enlightening and interesting.

LLOYD A. HALL  
Technical Director  
The Griffith Laboratories, Inc.  
Chicago

### Quarter-Century Drydex

TO THE EDITOR: Your article "Ready Mixes Sweeten Dry-Flavored Sales" (Aug. 3, p. 78) cannot pass without comment from us.

Sealed-in flavors did not make "their debut within the past decade" but were first manufactured 25 years ago by this company, which claims to be the originator of the materials (cf. *American Perfumer*, March '56, p. 62).

We were horrified by your scath-

*CW* welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to:  
H. C. E. Johnson, Chemical  
Week, 330 W. 42nd St., New  
York 36, N.Y.

ing comment on English flavors, which surely cannot have referred to the "sealed-in" types, which we have marketed under the name Drydex in ever-increasing volume since the inception of the idea. These flavors, on the contrary, have always been so good that in spite of the fact that we have since been imitated by manufacturers both in Europe and in the United States, we can still justly pride ourselves that we have maintained our lead, with regard to both flavor and storage qualities. . . .

PETER P. HOPF  
Product Development Manager  
A. Boake, Roberts & Co. Ltd.  
London, England

*CW derogated no particular brand, merely reported U. S. users' general criticism.—Ed.*

### Pressure Raises Heat

TO THE EDITOR: Your interesting article on National Carbon's "arc image" furnace (Oct. 5, p. 59) mentioned that Arthur D. Little's comparable furnace will develop 6000 C. We would like to point out that temperatures of 6000 C can be approached only when the arc is suitably pressurized. Without pressurization, a temperature of about 4000 C would be reached, which would be the same as reported by National Carbon.

PETER E. GLASER  
Arthur D. Little, Inc.  
Cambridge, Mass.

## MEETINGS

**Fourth Pan-American Congress of Pharmacy and Biochemistry**, Hotel Mayflower, Washington, Nov. 3-9.

**National Paint, Varnish and Lacquer Assn.**, 70th anniversary meeting, Sheraton-Park Hotel, Washington, Nov. 4-6.

**Technical Assn. of the Pulp and Paper Industry**, 11th alkaline pulping conference, Francis Marion Hotel, Charleston, S.C., Nov. 6-8.

**World Metallurgical Congress**, Knickerbocker Hotel, Chicago, Nov. 6-8.

**American Petroleum Institute**, 37th annual meeting, Conrad Hilton, Congress and Palmer House, Chicago, Nov. 11-14.

**American Standards Assn.**, eighth national conference on standards, St. Francis Hotel, New York, Nov. 13-15.

# 20 USES

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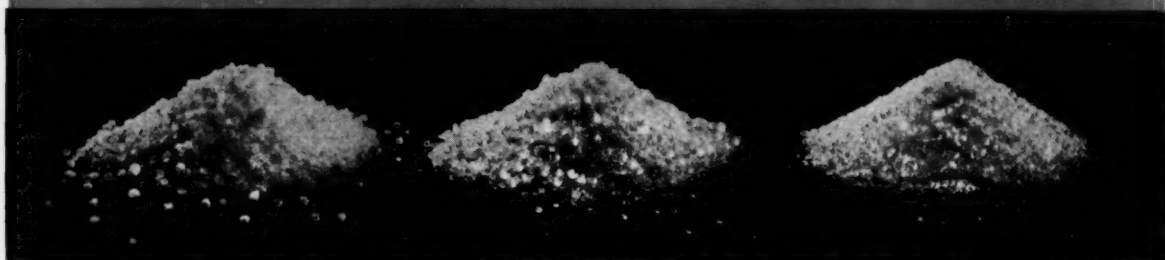
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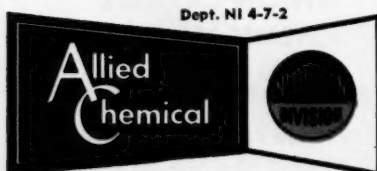


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# Business Newsletter

CHEMICAL WEEK  
November 2, 1957

A continued high level of business in 1958 is the forecast of top U.S. businessman-members of the Commerce Dept.'s Business Advisory Council who met last weekend at Hot Springs, Va. They expect continued high levels of business activity with little movement upward or downward, and with a reduction in spending for plant expansion—a situation that's likely to exist in the chemical industry (*see p. 21*). The BAC, which meets semiannually to advise the Secretary of Commerce, is currently headed by Jersey Standard Oil's Board Chairman Eugene Holman.

Third-quarter earnings statements are generally good this week.

- Du Pont improved earnings 11% over last year's first nine months. It reports earnings of \$6.44/share, compared with \$6/share in 1956. Sales were up 6.6% to \$1,495 million.
- National Lead's net income for the nine-month period set a new record at \$12.6 million. Earnings were up 3.4% to \$42.8 million, while sales were down 2.5% to \$417 million.
- Reichhold Chemicals reported a nine-month net income, excluding profits from sale of some investments, that totaled \$2.7 million, up 47.6%. Sales amounted to \$50.3 million, up 15.2%.
- Air Reduction posted new highs in sales and net income for the nine-month period. Net was \$12.4 million, up 6.7%; sales were \$141 million, up 13.8%.
- Wyandotte, too, registered new highs for the same period. Net was \$3.7 million, up 1%; sales were \$63.0 million, up 7%.
- Victor Chemical reports nine-months net income of \$2.8 million, up 4.6% from last year's period, with sales up 7.1% to \$39.4 million.
- Schering Corp., consolidating figures with its recent acquisition, White Laboratories, reports a nine-months net of \$8.9 million, up 2.3%, on sales of \$55.3 million, up 8.8%.
- G. D. Searle earned \$5.2 million for the nine months, up 7.3%, on sales of \$23 million, up 10%.
- Smith, Kline & French's nine-months earnings were \$15.6 million, up 6.7%, on sales of \$85.4 million, up 9.6%.
- Abbott Laboratories had three-quarter earnings of \$9.7 million, up 16%. It reported sales of \$84 million, up 12%.

Latest move affecting the Du Pont-General Motors antitrust case:

In Chicago, U. S. attorneys proposed to the federal court that



## **Business**

### **Newsletter**

(Continued)

Du Pont's holding of 23% of General Motors common stock (63 million shares) be distributed to holders of Du Pont common stock over a period of 10 years. Under the plan, Du Pont's GM holdings would be put into a trust, directors of which would distribute the shares on a *pro-rata* basis to all stockholders except those of the du Pont family-dominated Christiana Securities Corp. and Delaware Realty and Investment Co. Also proposed: that Du Pont stockholders may vote the GM stock they would receive.

**Du Pont has not yet made a formal proposal**, although it has "suggested," as noted by President Crawford Greenewalt in a letter to stockholders, "that the mandate of the Supreme Court would be satisfied by removing [the company's GM voting rights], restricting Du Pont's representation [on GM's board], and permitting [the GM stock] to be voted on important stockholder issues only with permission of the court."

•

**The proposed sale of General Aniline & Film assets** by the U. S. government won't be taken up by the World Court. In effect, the court said that, since the U. S. has not definitely scheduled sale of the company, there is no immediate reason for "measures of protection" to prevent sale.

Meantime, the question of whether the court shall have jurisdiction over the case hasn't been settled. Under international agreement, the U. S. can claim the matter as a domestic issue, refuse to submit it for arbitration.

Significantly, the 14 concurring opinions of the court denying a petition filed by the Swiss government included nine opinions based on the contention that "there is no need for action now" and five based on the matter of jurisdiction. This indicates that the majority of justices think Swiss interests—the holding company, Interhandel—still have sufficient protection in a current review by the U. S. Supreme Court.

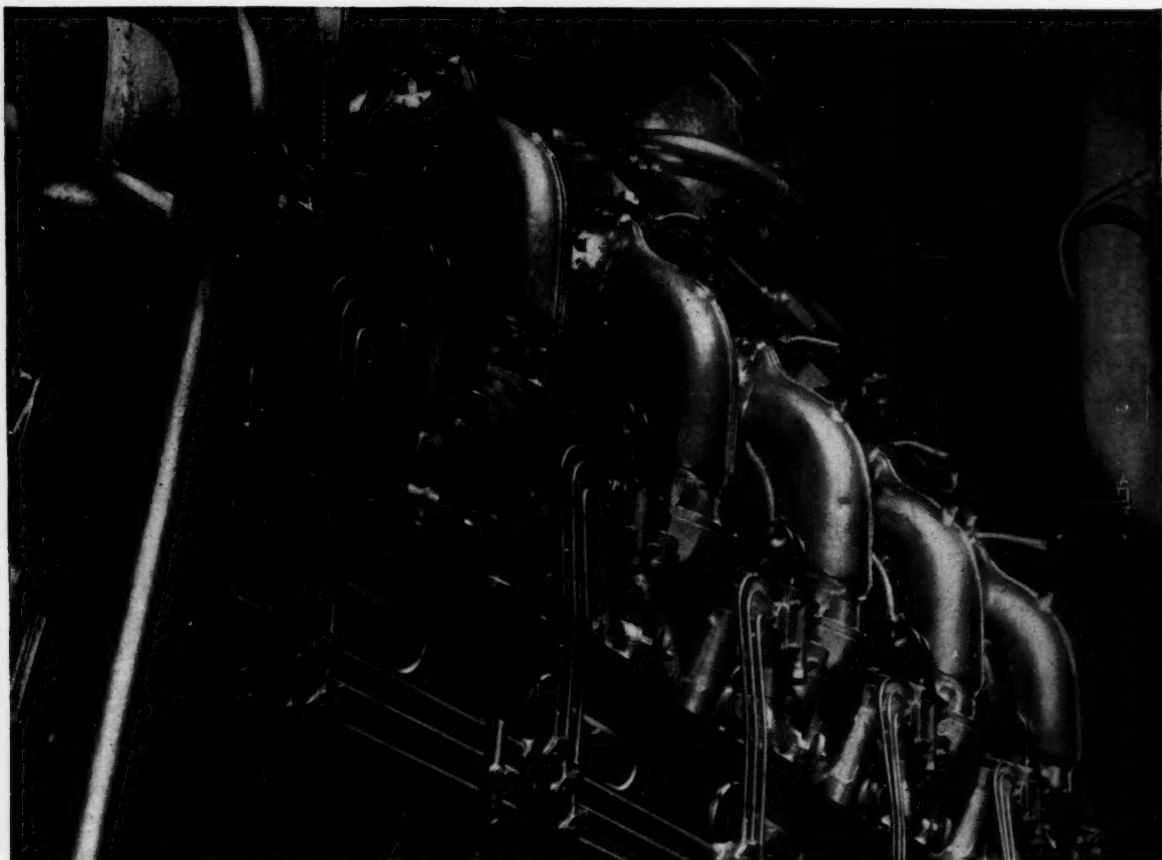
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**A resounding defeat for Oil, Chemical & Atomic Workers** Union was registered in NLRB-ordered elections at Union Carbide's Institute, W. Va., plant. By a vote of 902-353, Carbide employees rejected OCAW's bid to be their bargaining agent (*CW Business Newsletter*, Sept. 28). All but 38 of the 1,295 eligible voters cast ballots; and although two votes were challenged, they were not voided.

•

**Pollution charges against Great Lakes Carbon Corp.** are being aired in a Denver federal district court. Twelve families from Florence, Colo., where Great Lakes makes Perlite, are jointly seeking a total of \$102,000 damages because dust and sediment from the plant have allegedly impaired the families' health and comfort and have deprived them "of the ordinary use of their homes." Great Lakes seeks a dismissal on grounds the families have failed to state a claim upon which relief can be granted.





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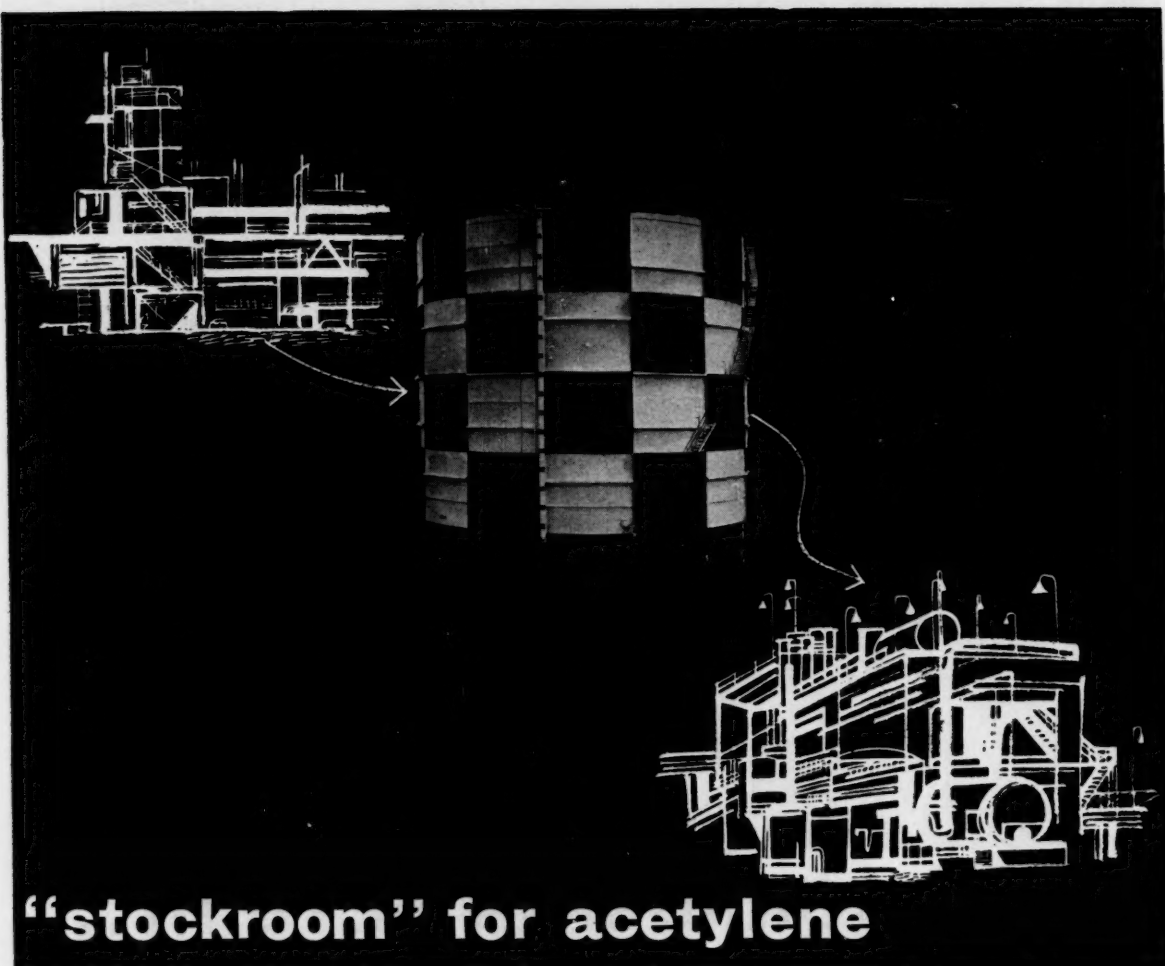
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## **“stockroom” for acetylene**

**Linde Company\* purchases Wiggins Gasholder  
for storage of acetylene  
between production and use cycles**

Ever since the Linde Company's new acetylene plant in Montague, Michigan went “on stream”, a new 100,000-cubic-foot Wiggins Gasholder has played a vital role in the operation. Every cubic foot of acetylene produced passes through the “stockroom” on its way to DuPont for use in the production of Neoprene. The gasholder provides acetylene storage and serves as surge capacity to enable Linde to satisfy both normal and emergency requirements.

If you produce, store or use gases, investigate the advantages of Wiggins Gasholders. They can be built to any capacity—from 50-cubic-feet to a million. Call or write General American for complete information.

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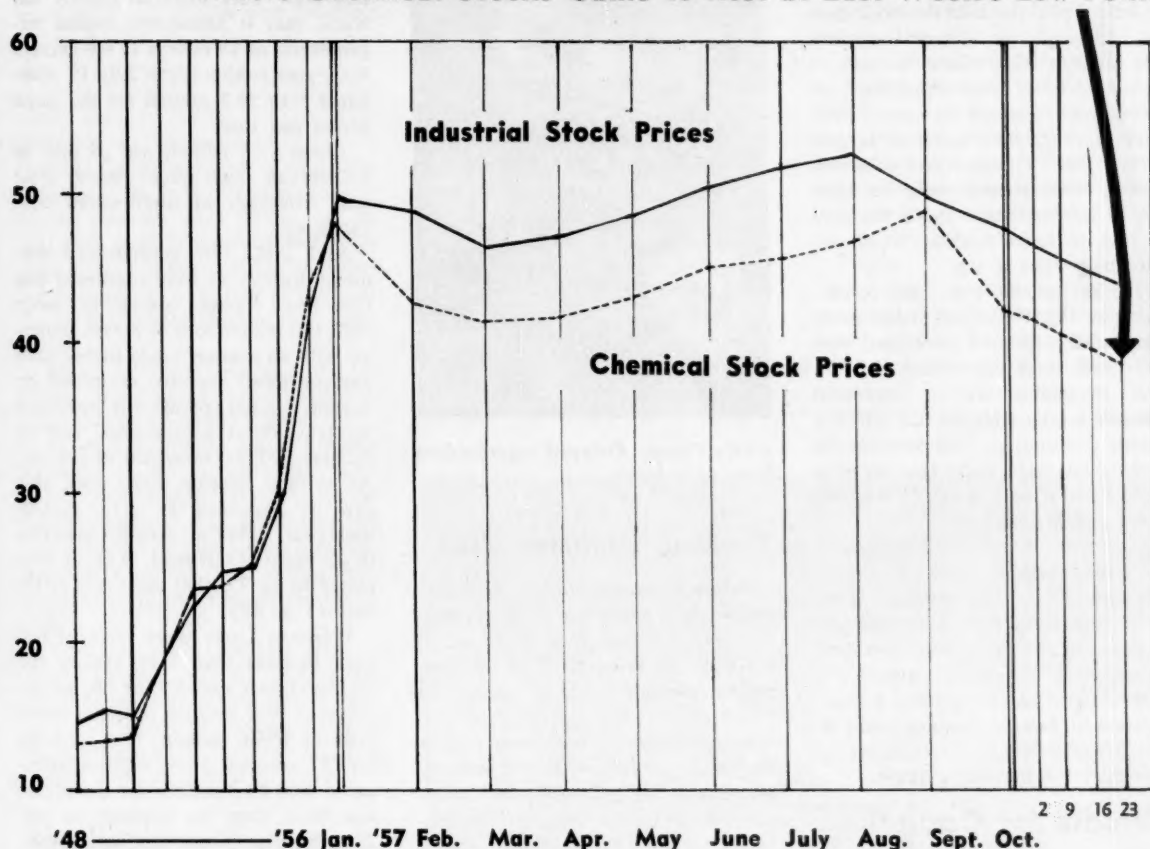
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*Offices in Principal Cities*



Source: Standard & Poor's.

## Where Chemical Stocks Came to Rest at Last Week's Low Point



## Stock Break: What Does It Tell About '58?

Chemical stocks hit a two-year low in last week's big stock market break (see chart), then like most of the market, bounced partly back in a show of strength. Spectacular as it was, last week's market performance is not nearly as significant as the three-month securities decline that began in mid-July.

The stock market carries little weight as a short-term barometer of business—it's too sensitive to extraneous upsets. On the other hand, the decline of the last 90 days is sparking some serious study.

The weakness is attributed to many

factors: the Federal Reserve System's tight money policy; defense spending cuts; expectations of reduced capital expenditures; uncertainty about the business outlook; heightening international tensions; confusion over future government spending; etc.

**'Reasonable Optimism':** To many observers, these factors add up to some business slack-off in '58—at least in the first half. One CPI executive interviewed last week by *CW* put it this way: "We're not wildly enthusiastic, but we still entertain reasonable optimism about business in the next nine months."

**Consensus:** although chemical business will stay at high levels in '58, companies won't show the earnings gains that buoyed the popularity and growth of chemical stocks in the last ten years (see chart).

**Production Up:** Meanwhile, chemical output surges. Indeed, since the beginning of '57, chemical output has been at a rate consistently higher than that of all industrial production. And chemical output has been rising steadily since July, even though all-industry production has been declining. Now, chemical production is 2% above the January figure, 6% above July's low.



Some of this rise is undoubtedly due to seasonal considerations as chemical makers fill fall and winter orders. And some is due to current replenishing of depleted inventories. But some of the gain is the result of increased business.

**Money Market:** If the three-month stock decline continues, chemical management will be less inclined than ever to seek capital funds in the stock market. Although the chemical industry has for some time raised the bulk of its capital funds from depreciation reserves and retained earnings, stock issues have not been scarce in the past several years. Consequences of a continuing stock decline would be wider use of internal funds and a tendency to turn to bond markets, which are hardening after a sag.

The decline, however, may be running out. On Wednesday of last week, the market registered the biggest one-day jump since the winter of 1929. This, of course, was in substantial measure a rally after the bad fall. But the big questions on Wall Street at the close of last week were: Has the market reached a turning point? Is a sustained rise in prospect?

A number of signs indicated that a yes answer might be more than starry-eyed speculation. Not the least heartening clue, for the stock market and business in general, was President Eisenhower's midweek speech; a loosening of tight money and a liberalization of defense spending could be the Administration's contribution to a brighter '58 business outlook.

## Climate for Capital

**Dow Chemical** President Leland Doan Monday evening called for an overhaul of the U. S. Trade Agreements Act to provide a better climate for U. S. investments abroad.

Doan, who spoke before the Economic Club of New York, said any U. S. foreign aid program should rely on private capital as a stimulus to underdeveloped countries.

He decried the value of a new United Nations plan for distribution of public funds to such countries.

Instead, he said, the Trade Agreements Act should be changed to more adequately protect domestic investment, but to prevent foreign investment solely for the purpose of capitalizing on lower operating costs abroad.



AEA's Penney: Delayed repercussions from an H-bomb.

## Seeking Disaster Clue

**Britain's Atomic Energy Authority** this week is in the midst of an intensive private investigation of the recent calamity at Windscale, the government's plutonium-making station in Cumberland (*CW*, Oct. 26, p. 21).

Latest reports indicate that reactor overheating may have been caused by experiments on hydrogen-bomb material ordered by AEA member Sir William Penney. The experiment was a followup test on materials recovered from Britain's recent trial explosions in Australia.

Another point under investigation is the fact that at the time of the incident, AEA urgently ordered large quantities of protective clothing and had made plans to evacuate the area surrounding Windscale. Neither the protective clothing, nor the evacuation plans were put to use.

The decision not to evacuate and the question of the need for large amounts of protective clothing are under fire from scientists at Windscale as well as from some British health experts.

AEA hopes to make known its findings at a conference within the next two weeks.

## IMC Seeks Potash Future in Canada

Despite the gloomy potash outlook, **International Minerals & Chemical Corp.** is surging ahead with its expansion program. IMC spokesmen told New York financial experts last week, that it anticipates capital expenditures of \$9 million in the current fiscal year (which began July 1), compared with \$8.3 million for the same period last year.

About \$3.5 million will go into its \$20-million "high-grade" potash mine near Esterhazy in southeastern Saskatchewan.

Said IMC: "By concentrated diamond drilling, we have confirmed one Canadian deposit containing more than 100 million tons of potash minerals with an average grade higher than any previously reported or mined by anyone." Initial operation is scheduled for late '59, at a production rate of roughly 720,000 tons/year of the ore. As markets develop, IMC says, this can be expanded to 2.16 million tons/year. IMC's potash capacity (K<sub>2</sub>O basis) at Carlsbad, N.M., is estimated to be 375,000 tons/year (*CW*, July 13, p. 69).

President Louis Ware reported net sales of more than \$106 million for the fiscal year ended June 30, an increase of 10% over the previous year's sales of \$96.6 million. Net earnings for '57 reached \$6.96 million, compared with \$5.4 million for the previous fiscal year. In addition to the 29% increase in net earnings, a gain of \$713,350 after taxes was realized from the sale of property.

Helping to swell this year's sales volume were increased shipments of Dynafos (dicalcium phosphate) and triple superphosphate.

According to Ware, IMC's production of monosodium glutamate is 10-12 million lbs./year. Although IMC is the largest U.S. producer of monosodium glutamate, output from Japan—about 20 million lbs./year—leads in the world market.

Stockholders of IMC last week voted to increase the number of common shares from 3 million to 5 million. Ware said the increase isn't earmarked for any special use, but will be on hand for use in possible company acquisitions.



## Uranium Readjustment

In a major "readjustment," the Atomic Energy Commission is canceling contracts with National Lead Co. for operation of a uranium processing plant in Grand Junction, Colo., and a raw materials research lab in Winchester, Mass. Moreover, the U.S. Geological Survey will suspend the exploration and development program it has carried on under AEC direction in Colorado.

Jesse Johnson, AEC's materials chief, disputes reports that the cancellations are the result of a cutback in AEC exploration and development programs. He says that operations at Grand Junction were simply too big and that work being done there was duplicating too much of the work being handled by the Bureau of Mines at its ore-forecasting plant at Salt Lake City.

Robert Beverly, manager of the Grand Junction operation, said the plant will go on stand-by basis.

Reasons for ending the Winchester laboratory's contract and USGS' program are less clear. Washington observers feel that the commission will concentrate its efforts somewhere else, perhaps in another field, without any substantial reduction in over-all spending.

When the AEC contract terminations take effect, June 30, '58, National Lead hopes to keep both Grand Junction and Winchester operations going on a private basis, may operate them jointly with other interested firms.

## No Antitrust Letup

Chemical processing firms now under fire from antitrust suits can expect no letup from last week's newly appointed U.S. Attorney General William Rogers. Washington observers report that the changeover to Rogers from Herbert Brownell will mean no drastic changes in Justice Dept. policy or direction.

Just as Brownell has pushed, so Rogers can be expected to push for a cleaning up of the business of the Office of Alien Property, a Justice Dept. subdivision. That means, foremost, that Rogers will be expected to insist on sale of General Aniline & Film assets as early as possible.

And, as Brownell has been, so will Rogers be expected to continue Jus-

tice Dept.'s surprisingly tough antitrust and antimonopoly policies.

**Day-to-Day Concern:** On what will continue to be Justice's most demanding day-to-day concern, the broad sweep of civil rights enforcement, Rogers will be at least as tough as Brownell—and many in Washington think he may well turn out to be even a more vigorous enforcer of Negro rights.

Rogers is a New York Republican who, paradoxically, got his first big political break serving under then-Sen. Harry Truman, as counsel for the committee that made wartime headlines by exposing "five percenters."

Rogers likes the rough and tumble of Capitol Hill politics and, for that matter, most any politics. He is the closest Washington friend and advisor of Vice-President Richard Nixon. Rogers is young (44), and generally thought of as friendly and extroverted.

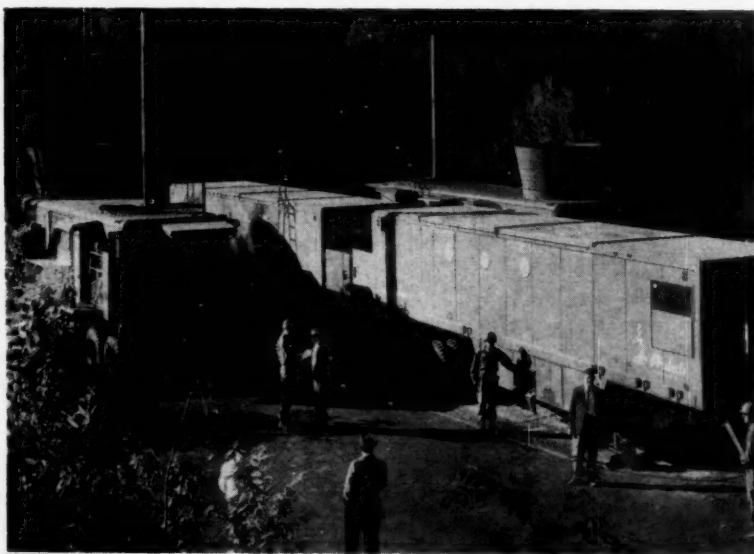
## Southern Sulfur Hunt

Development of oil, natural gas and sulfur may be in prospect in North Carolina, if plans of an independent oilman pan out. He is J. E. Fitz-Patrick, a Texan.

Fitz-Patrick has signed a preliminary agreement with North Carolina to lease 1.2 million acres of submerged state-owned coastal land from the Virginia line south to Beaufort, N.C.

Under the agreement, Fitz-Patrick must drill exploratory wells totaling 12,000 ft. every two years, or the lease automatically expires. If oil or gas is found, the state will get a standard one-eighth royalty; and, if sulfur beds are discovered, the state's royalty will be 50¢/long ton.

Neither sulfur nor petroleum has been proved present in commercial quantities, but Fitz-Patrick tells *CW* there are oil-producing sands in the area that haven't been thoroughly tested.



## Mobile LOX Maker for Missiles

The U. S. Army Corps of Engineers at Ft. Myers, Va., last Sunday showed off its new low-pressure—100 psi.—mobile liquid-oxygen plant to be used for fueling the Army's Redstone missile. Operating at a normal atmospheric pressure, the \$1-million plant can produce 20 tons/day of 99.5% pure LOX. Operating temperature ranges

are 125 to —25 F.

Built by Air Products, Inc. (Allentown, Pa.), the plant consists of two air intake and compressor units (left and right rear, above), a heat exchanger (center rear) and a separation unit (foreground). The plant yields 2 lbs. of LOX for each pound of diesel fuel consumed.



## COMPANIES

**U.S. Manganese Sulphate Corp.**, a newly incorporated firm, will mine manganese ore in North Carolina and eastern Tennessee. The company will also manufacture manganese sulfate. Headquarters are in Asheville, N. C.

**American Home Products** shareholders last week approved a two-for-one split of the company's stock. When the split goes into effect, at the end of November, the firm will have 7,681,570 shares outstanding. Shareholders also approved an employee stock-option plan and an increase in authorized capital stock from the current 5 million shares to 10 million.

**Sylvania Electric Products Inc.** has changed the name of its Tungsten and Chemical Division to the Chemical & Metallurgical Division. Sylvania Vice-President Marion Pettegrew said the new name gives a clearer indication of the line of products manufactured by the division.

**Sun Chemical Corp.** seeks to buy Ansbacher-Siegle Corp. (Staten Island, N. Y.), manufacturer of color pigments. Directors of both firms have approved merger terms, and a special meeting of Sun's stockholders has been scheduled for Nov. 29, when shareholders will vote on the proposal.

## EXPANSION

**Sulfuric Acid:** Platte Chemical Co. (Salt Lake City) will build a \$2.5-million sulfuric acid plant near Casper, Wyo., to supply uranium processing mills in the Gas Hills area 80 miles west of Casper. And Davison Chemical Co., division of W. R. Grace, has an option on land near Casper, reportedly for a new sulfuric acid unit.

**Metallic Stearates:** Witco Chemical Co., Canada, Ltd., newly formed Canadian affiliate of the U.S. firm, is building a new 1-million-lbs./year metallic stearates plant at Oakville, Ont.

**Cement:** Imperial Cement Ltd., newly formed Canadian firm, will build a \$12-million, 700-tons/day cement plant near Edmonton, Alta. Initial capital will be raised through an offering of 110,000 common shares. Raw material will come from the Big Lake region, three miles north of the plant site, where large deposits of marl are available.

**Plastic Pipe:** A. M. Byers, maker of wrought iron and steel products, will start selling a line of polyvinyl chloride pipe. General Tire & Rubber Co., which has a majority interest in Byers, will produce the pipe for

the latter at its Bolta division. Chief sales targets are petroleum and chemical firms.

**Pulp & Paper:** Boise Cascade Corp. this month will start construction of the first unit of a multimillion-dollar pulp and paper installation at Attalia, Wash. By mid-'58, the company should complete a container plant on its recently purchased 157-acre site. Within 18-24 months, it will add a pulp and paper mill. Contractor is Hoffman Construction Co. (Portland).

**Ceramics:** Gladding, McBean & Co., West Coast ceramic products maker, will complete two major expansions before the end of '57. The first is a \$2-million unit to replace its existing plant in Mica, Wash., where refractory and face brick will be produced. The other is a new \$5-million plant, now being completed in Corona, Calif., to make vitrified clay pipe and multiple-duct conduit. Both should be ready by mid-December.

## FOREIGN

**Paper/Brazil-Asia:** Two major Japanese paper firms are looking overseas for sites. Sanyo Pulp Co., Ltd., will make a two-month survey in Brazil of possible sites for a small-scale paper plant, which would later be expanded to produce synthetic fiber pulp. Jujo Paper Mfg. Co., Ltd., plans a similar survey of the Philippines, Indonesia and Burma in December. Lack of domestic raw materials is the chief reason for the proposed overseas plants.

**Refinery Chemicals/Britain:** British Petroleum Co., Ltd., will commission two new units next year at its Hamburg, Germany, refinery: a 400,000-tons/year Hydro-finer for removing sulfur from gas oil and a 350,000-tons/year catalytic reformer for producing a high-grade motor spirit component. Processing capacities of both its Antwerp, Belgium, and Hamburg refineries will be raised a total of 1.5 million tons/year.

**Medicinals/Poland:** Poland's state-controlled chemical industry will start producing two new products: iodine and Aureomycin. Construction of a new 5-tons/year iodine plant in Debowiec Slaski will start this year for completion by the fall of '58. The Chemical Works of Pabianice, near Lodz, has already started building a new unit to produce Aureomycin, expects to have it in production before the end of this year.

**Formaldehyde/Austria:** Austria's Vereinigten Chemischen Fabriken Kreidl, Rutter & Co. will boost its formaldehyde output 150%. The firm hopes to be producing 15,000 metric tons/year by early '58. It will also double its production of amino plastic materials by the end of '58.



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**GLUES, ADHESIVES**—Used as a solvent for adhesive compounds and in production of industrial and decorative adhesive tapes.

**INK**—These have application as solvent in production of intaglio, heat set inks, printing inks, etc.

**INSECTICIDES**—Several are used as solvent and carrier for insecticides.

**OILCLOTH, ARTIFICIAL LEATHER AND COATED PRODUCTS**—Applied as a solvent in the printing of table and floor oilcloth; also in the impregnation of various types of fabrics.

**PAINT, VARNISH & LACQUERS**—Used as solvent and thinner in manufacture of decorative and industrial paints, varnishes, lacquers and enamels. Also varnish removers and specialties.

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**TEXTILE**—Amsco naphthas are used for cleansing fabrics and also for pad dyeing, printing and treating.

**WAX & POLISH**—Amsco naphthas are ingredients in many compositions of liquid and paste waxes and polishes, such as for floors, furniture, shoes, etc.

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PP57-4



# Washington Newsletter

CHEMICAL WEEK  
November 2, 1957

A review of commodity stockpile goals, which Defense Mobilizer Gordon Gray promised Congress during the pre-Sputnik days when cutting military budgets was the watchword, will get under way in the next few days. Gray will name a citizen's advisory committee to handle it. The study, Gray says, will go beyond an item-by-item survey of strategic metals, minerals and chemicals on hand, and will aim at a restatement of over-all stockpiling policy.

The move is also an answer to critics who charge that government stockpile concepts are outdated. However, Gray says the review will not recommend sale of stocks already on hand. (Such sale would take a special act of Congress.)

There'll be no five-year extension for the reciprocal trade act. The Administration, of course, is more than ever convinced that, in the present world situation, a liberal trade policy is essential. Top officials would like to see the Trade Agreements Act extended for five years, as suggested by Vice-President Nixon, when it comes up for renewal by Congress in '58. But White House strategists realize that, with protectionist sentiment on the rise on Capitol Hill, they face a tough job in getting the act extended at all. They'll be glad to settle for a three-year extension—or even less—if it means getting the trade act past Congress without crippling amendments.

Labor legislation is almost certain next year. Its object: to somehow do something about the kind of corruption that the McClellan committee has unearthed.

There are three views as to what legislation is needed:

The White House will advocate secret balloting for union leaders, restrictions on picketing for organizing purposes, and supervision on union funds. These proposals are tougher than any previous Administration ones.

Conservative Republicans want a major rewrite of labor law. A federal right-to-work law is talked about, along with application of tax and antitrust laws to unions, which are now exempt.

Organized labor itself is backing some federal controls over health and welfare funds. But otherwise, labor leaders are out to prove that they can handle their own problem children—this is one reason why AFL-CIO won't hesitate to kick Hoffa and his teamsters out of the federation.

No one knows for sure just what laws will finally be voted. But the general support for some kind of new regulation almost guarantees legislation before Congress goes home next year.



# Washington Newsletter

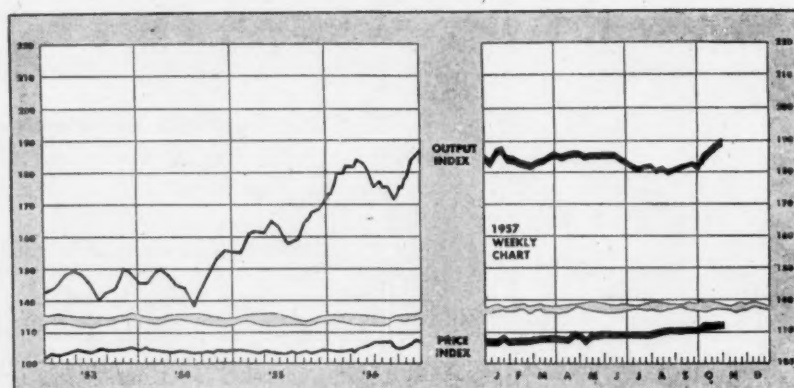
(Continued)

**The labor outlook itself is loaded with storm-warnings:** If the teamsters are ousted from AFL-CIO, jurisdictional flare-ups are expected all around the country. AFL-CIO unions that have ties with the teamsters in scores of cities must now break them. Some of these working arrangements will continue to be effective, whether there's a formal setup or not. But in general, interunion warfare is a sure thing for the months ahead.

This development may parallel John L. Lewis' warfare on other unions when he first withdrew from AFL to set up CIO, and later pulled out of CIO to go his own way.

**A joint British-U.S. military research-development program** is one certain result of Russia's Sputnik. Administration officials insist, in public at least, that our technology is on a par with that of the Soviets, and that, across-the-board, our position on advanced weapons is as good as and probably better than that of the Russians.

**But the Eisenhower administration is on the defensive.** As far as the public is concerned, it was in charge when the U.S. came in second in one lap of a race in which finishing second may mean not finishing at all. Thus, the move to set up a joint program is bound to be popular in the U.S. It has become clearer than ever before that swapping the latest technological information is important and worth the price.



## Business Indicators

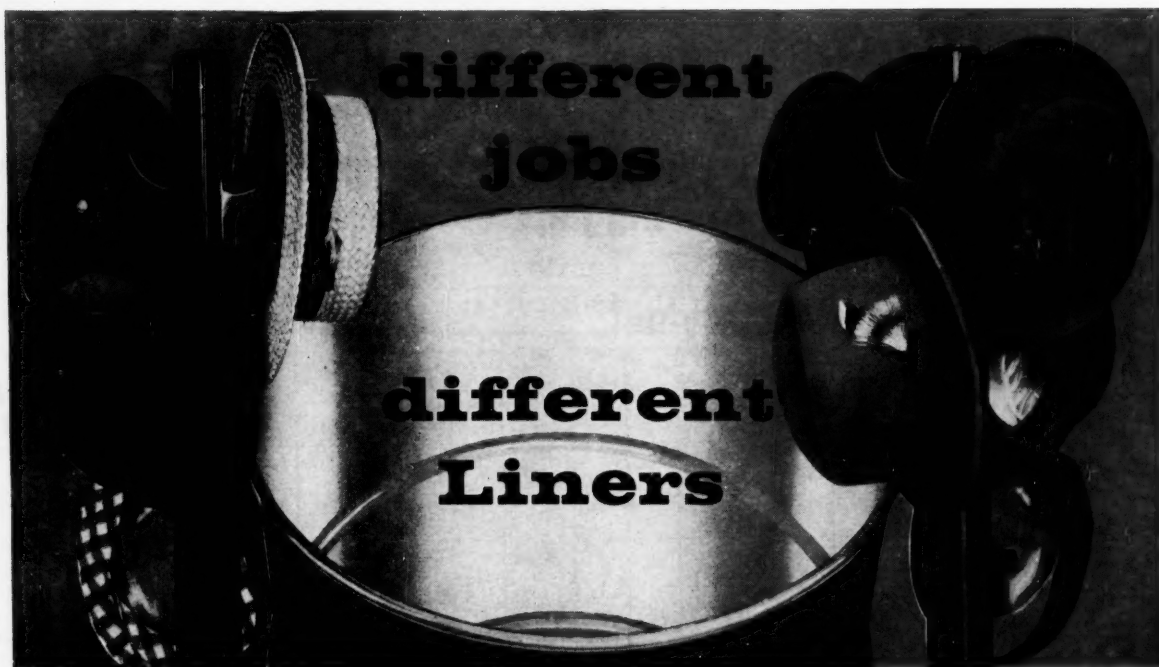
### WEEKLY

	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100) .....	190.0	189.5	180.8
Chemical Week wholesale price index (1947=100) ...	111.0	111.0	105.8
Stock price index of 11 chemical companies (Standard & Poor's Corp.) .....	39.21	39.57	44.84

### MONTHLY

	Manufacturers' Sales			Manufacturers' Inventories		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All manufacturing .....	28,571	29,030	27,588	54,142	54,093	50,378
Chemicals and allied products .....	2,054	2,008	1,931	3,769	3,728	3,475
Petroleum and coal products .....	2,895	2,991	2,671	3,528	3,494	3,121





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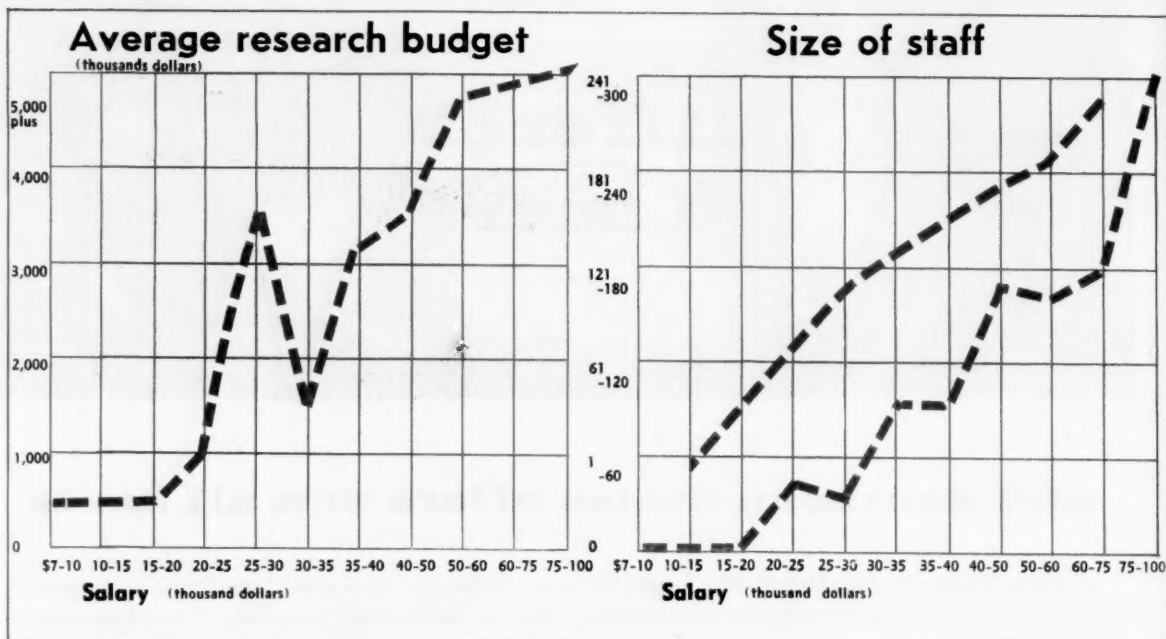
SINCE 1914

Birmingham, Alabama



# RESEARCH

## Budgets and Staffs Are Bigger



## Higher Salaries, Heavier Responsibilities

It's more profitable to be a research director—but the responsibilities of the job are stiffer. That's the crux of a comparison of results of a new CW survey with those of a similar survey two years ago (CW, July 30, '55, p. 32).

Both surveys asked for anonymous information on research executives' salary; budget; staff; experience in research management; highest academic degree; and an opinion of executives' income status. But the findings of the two surveys differ appreciably.

Salaries are moving up and so are budgets (see tables). But budgets are increasing at a faster rate, particularly in firms previously reporting \$1 million/year or less in research outlays. In '55, the \$15,000/year man was administering a budget of around \$1 million. Now, for the same salary, his budget is nearer \$2 million.

Staffs are getting bigger, too (see table). And that's another measure of the growing administrative burden.

The \$25,000/year research directors now report that an average of 213 technically trained workers are under their supervision. Two years ago, the number of such workers averaged about 150.

Reaction to this state of affairs, as reflected in opinions returned on the survey form, is mixed. While 74.5% of the research directors considered their salaries "average" for the chemical process industries, 16.2% felt their compensation was "below average," compared with the compensation received in other CPI positions requiring comparable experience and education.

**Room for Improvement:** Despite the general satisfaction expressed by the survey respondents, some research directors are critical of the rewards of their profession. Flattening salary pyramids in their companies are a major concern.

"Management salary increases have not kept up with increases for the lower grades," reports one top ad-

ministrator, "so middle management is reluctant to recommend further increases for newer employees. The result is general discontent." That's an opinion shared even by some research directors who feel their personal salaries are adequate.

Another complaint is that salaries do not reflect the contributions made by research to company profits. One survey respondent sadly notes that he shared no reward in helping to boost his company's profits 30% last year. A colleague observes that "engineers and scientists are falling behind, at an accelerating rate, when their real earnings are compared with their contributions toward the nation's production of wealth."

Even the contented research executive can find some criticism to make. Says one, "Although my salary is average, it's still on the low side for the responsibilities the job entails. I believe many other research directors in comparable positions feel the same



## Salary Profile of the Research Director

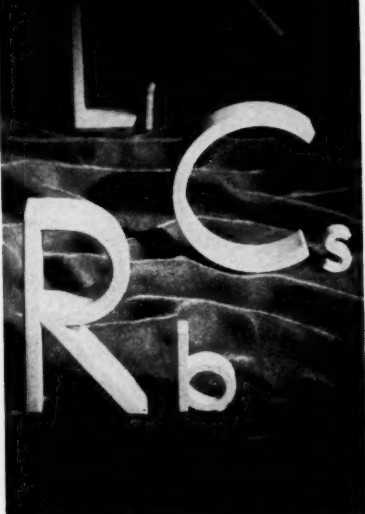
Years since highest degree	Average years as research director	Salary (thousand dollars)
5.0	0-2	\$ 7-10
14.0	4.3	10-15
20.0	9.0	15-20
19.0	9.6	20-25
22.0	11.3	25-30
18.0	11.3	30-35
20.0	12.0	35-40
21.0	12.0	40-50
20.0	12.0	50-75
20.0	18.0	75-100

## Most Are Now in \$25-50,000 Class

Salary (thousand dollars)	Percent research directors making this salary		Percent change
	July '55	Nov. '57	
\$ 7-10	20.0	2.3	-17.7
10-15	38.0	14.0	-24.0
15-20	17.0	25.6	+ 8.6
20-25	11.0	14.0	+ 3.0
25-50	12.0	37.2	+25.2
50-100	2.0	6.9	+ 4.9



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## RESEARCH

way about their salary situations. Taxes take away so much these days that it is hard to get ahead financially."

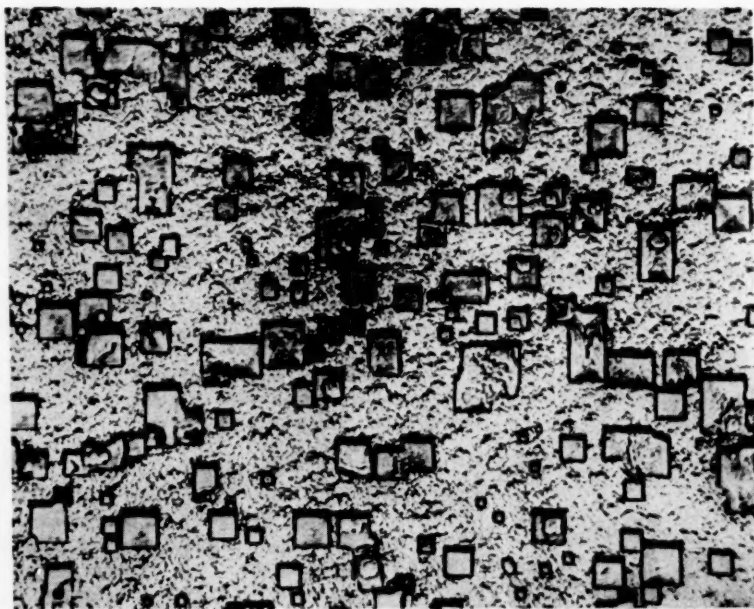
**Brighter Side:** Of all respondents, 9.3% thought their earnings were "superior" to salaries in comparable management posts. Their opinions ranged from an optimistic "very happy about my entire situation" to a qualified "I feel compensated by some sense of security, and of doing a worthwhile job."

While the typical research director's financial position is changing, the same is not true of his educational background and experience. He's still the possessor of one or more graduate degrees and a seasoned industrial veteran. Of all the survey respondents, 68% own Ph.D. degrees, 11.6% have masters, and 16.3% have only bachelor degrees. The remaining 4% have miscellaneous degrees such as M.D. and L.L.B.

The salary gap between Ph.D.s and the other degrees is closing, however. Average salaries: \$27,600, \$25,200 and \$20,800 for the Ph.D.s, masters and bachelors, respectively. In '55, salaries of research directors holding bachelor degrees and those with masters weren't appreciably different.

It takes about 20 years after his highest degree before a research director can command more than \$20,000/year (see table); by that time, he has accumulated about a decade of experience in his present post or one like it. After that, salaries in most cases level off.

Whether a statistical sketch of the average research director is very meaningful is open to conjecture; the talents and compensation of these executives vary widely. But, one thing is sure: the profession is growing in stature. And its rewards aren't likely to lag too far behind.



## Metal Research Turns a Corner

These magnified cavities, etched into a new electrical silicon steel developed at Westinghouse Research Laboratories (Pittsburgh), show up the crystal structure that imparts novel magnetic properties. Called Cubex, the steel can be magnetized in four directions instead of two, permits

magnetism to turn corners in the magnetic cores of electrical apparatus. Westinghouse worked with the Vakuumschmelze (Hanau, Germany) division of Siemens-Halske to develop the new steel, expects to use it in smaller, lighter, more-efficient electrical equipment.





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# PRODUCTION



Straddle carriers move pipe into storage area. It's an important part of Carbide's new system.

## Moving In on the Materials-Handling Load

Motorists touring West Virginia's winding Kanawha Valley this week will likely come upon an unusual highway sight somewhere between Institute and South Charleston: a straddle carrier (photo above) moving at a 30-mile-per-hour clip, with a load of valves, pipe—or perhaps a reaction vessel—tucked under its high cab.

But for local residents, the sight is fast becoming commonplace on that 12-mile stretch of road.

Reason: it's part of the regular routine of the new materials-handling system developed for construction materials and equipment by Union Carbide Chemicals Co.'s design and construction department. And, within the past few months, a day has seldom passed that there hasn't been at least one straddle-carrier highway trip (sometimes as many as seven or eight) between Carbide's Institute and South Charleston plants.

The straddle carriers play a big part in the system, which is keyed to the maximum use of palletization. Put into effect about a year ago at Institute, the system enables construc-

tion and equipment items to be handled in a manner more commonly associated with raw materials and finished goods. It reduces the number of handling steps, cuts manual handling 45% and has already built up a savings record that totals about \$100,000.

Designed to fit the daily needs of Carbide's Kanawha Valley chemical complex—its constant expansions, modernizations of existing processes, addition of new ones—the system helps hold down inflation-bloated construction costs in a period of increased construction activity.

**Start with Pineapples:** Idea for the materials-handling system was planted in the mind of the design and construction department's Harley Noland at a viewing of a Clark Equipment Co. movie showing straddle-carrier handling of pineapples in Hawaii. "If it worked with pineapples, there was no reason why it couldn't be made to work with construction materials," says Noland.

And, palletization using fork trucks was already widely accepted by build-

ing supply dealers. By adopting these techniques, adding a few innovations of its own, Carbide came up with the present system after a year's study. Here's how it works:

When a delivery truck pulls into the receiving dock, it is met by one of the two Carbide fork trucks. Hydraulic dock levelers allow fork truck entry into the delivery truck. If the load has not already been palletized by the supplier, the fork truck places an empty pallet on the dock or in the delivery truck and the fork truck operator unloads the material directly onto the pallet.

The fork trucks handle loads up to 4,000 lbs. for short hauls—carry the materials either directly to the store room for bin storage or to the materials shelter for field-storage assignment.

The straddle carriers pick up the pallets at the materials shelter, carry them to the four-acre open-air storage area. Here, storage is on a single level, no higher than 66 in., the maximum height of load handled by the straddle carriers. The area has a



drainage system and a slag surface. Since all the material is palletized, the drawbacks of open-air storage are minimized. And at muddy construction sites, the Carbide construction crews find that palletization helps considerably.

Since the straddle carriers were built for highway use, carry loads as wide as 56 in., the storage-area aisles are relatively narrow. "But aisles, and particularly turning areas, could have been even narrower," says Noland. "The straddle carriers are extremely maneuverable, can turn in the same area as a Cadillac sedan."

**Bolsters:** Large and long items that won't fit on the pallets (which are only 48 in. long) are placed on bolsters—actually pallets that have been specially constructed to fit the load. One of the largest bolsters is 50 ft. long, was made from two discarded telephone poles. It's used to haul large quantities of lightweight insulating materials.

Once it actually got the materials-handling program under way, Carbide found it could improvise pallets and bolsters for handling any material. One of the biggest savings resulted from use of the new method for structural steel and pipe. Previously, these long heavy items had to be moved by cranes and three-man crews from railroad car to construction site. Now, the crane and three-man crew is needed only for unloading from the railroad car. The straddle carriers do the rest.

**Quick Pickup:** When material is ordered from storage, the straddle carriers move through the open-air storage area, pick up what is required, and move it to the job location.

Mixed orders — where small amounts of material from different pallets are required—take more time. But the procedure is still rapid. An empty pallet is carried through the storage area. When the pallet with the required item is reached, the operator transfers from that pallet to the empty one the number of pieces ordered. He continues to move through the area, picking up items until the order is filled. The carrier is then on its way to the job site.

The ease and speed of pickups is particularly helpful to the shops. For



**Valves, moved to materials shelter, wait straddle-carrier pickup.**

example, when the pipe shop is required to fabricate a particular piping configuration, the carriers bring in the necessary pieces on a bolster. Once fabricated, the piping is quickly removed—again on the bolster. This means minimum storage of materials and finished work in the shop. And it gives the shop more working area.

**Flat-Bed Trucks:** The materials-handling system gives Carbide, in effect, a whole fleet of flat-bed trucks.

But since they are really only pallets and bolsters, they can be used for material storage, too, thus minimizing the number of times a "truck" must be loaded and unloaded.

And, the entire "fleet" requires only two power units—the straddle carriers—in addition to the fork trucks. The straddle carriers' being more maneuverable than trucks gives the system another plus.

There seem to be no serious limita-



**Fork truck tiers pallets at materials shelter, saves floor space.**





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AT YOUR FINGER TIPS, issue after issue, is one of your richest veins of job information—advertising. You might call it the "with what" type—which dovetails the "how" of the editorial pages. Easy to read, talking your language, geared specifically to the betterment of your business, this is the kind of practical data which may well help you do a job quicker, better—save your company money.

Each advertiser is obviously doing his level best to give you helpful information. By showing, through the advertising pages, how his product or service can benefit you and your company, he is taking his most efficient way toward a sale.

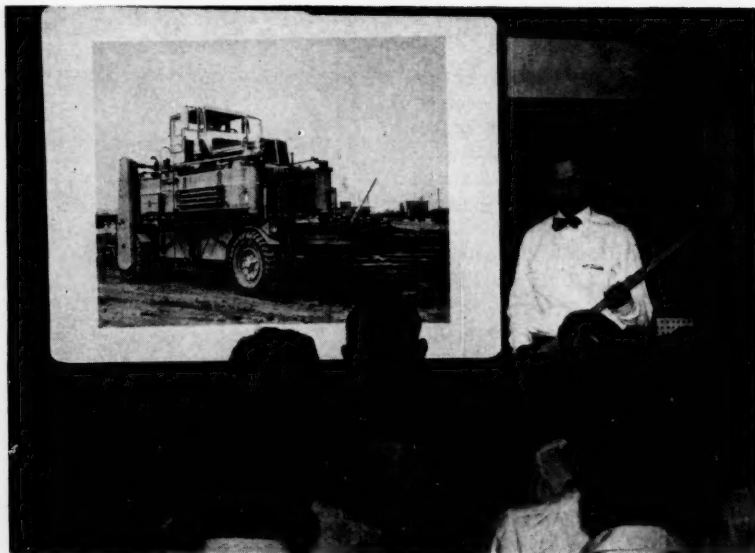
Add up all the advertisers and you've got a gold mine of current, on-the-job information. Yours for the reading are a wealth of data and facts on the very latest in products, services, tools . . . product developments, materials, processes, methods.

You, too, have a big stake in the advertising pages. Read them regularly, carefully to keep job-informed on the "with what" part of your business.

**McGRAW-HILL  
PUBLICATIONS**



**PRODUCTION**



**Carbide's Noland uses 10-minute film talks to explain system.**

tions of the system. Often, when a quick delivery of materials is required from a supplier, Carbide dispatches one of the straddle carriers for a pickup—even if the location is in downtown Charleston.

With the Institute and South Charleston plants so near each other, it was decided from the outset to supply both plants from one large storage area at Institute. The carriers were built to a width that would not require a special road permit from the state of West Virginia. Only stipulations: they cannot carry loads longer than 30 ft. without a special permit; and loads cannot exceed 18,750 lbs. (The straddles haul up to 30,000 lbs. within the plant areas.)

Although return trips from South Charleston do not usually involve payloads, the carriers are equipped with two-way radios. Operators check with home base before leaving South Charleston to find out if there is to be a return carry—either empty pallets and bolsters or a material pickup along the way.

Plants at other locations and in other Union Carbide Corp. divisions are studying similar installations. And a spur-of-the-moment decision by Noland is helping them.

**Say It with Movies:** Shortly after the system was installed, Noland was asked to discuss it at a Carbide industrial engineering meeting in New York. As he set to work writing the

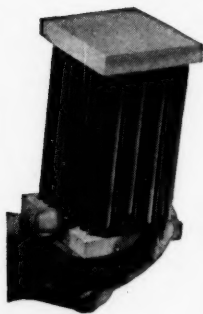
talk, he reached this conclusion: the ideal way to present the subject was with a motion picture. It would cut the amount of explanation needed, help clarify various points. And it would supplement, rather than replace, the talk, thereby shortening the time needed for a top-notch production.

Enlisting the aid of South Charleston's industrial engineering department, which supplied the photographer and film (color film was used because black and white didn't happen to be available), the entire project took only one day—less time than it would have taken to write the more complex speech originally planned, according to Noland. The time breakdown: about two-hours planning, four-hours shooting and about 10-minutes showing time.

The film—by Noland's own admission—was no work of art (e.g., exposures were not always the best). But it has been used at many Carbide gatherings since the original showing. And a second color film, dealing exclusively with straddle carriers, has been made. It requires an accompanying narrative, is for showing only within the Carbide organization. This film lasts 20 minutes, is far superior to the earlier one.

Like the materials-handling system they depict, the films are much in demand because they make a tedious job faster and easier.





## An important message to the man who thinks his air pollution problem is too difficult—or too expensive—to correct

Too often an air pollution problem exists today for one reason only: The company concerned does not yet know there is now at hand an efficient, effective method of correcting it—often at an actual saving through waste heat recovery.

The method is catalytic oxidation, and the firm that makes this development possible is Oxy-Catalyst, Inc.

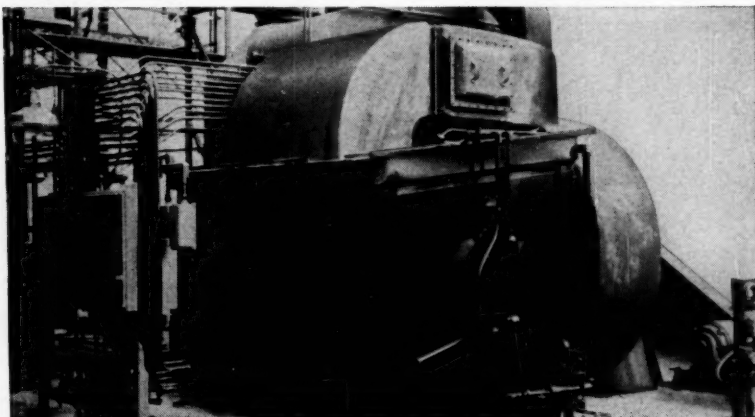
Catalytic oxidation works by "burning" harmful and irritating combustible contaminants in an exhaust stream at temperatures far below their normal ignition points. It provides close to 100% cleanup of foul-smelling fumes and odors. It reduces fire hazards and maintenance problems by eliminating troublesome condensates in oven and furnace exhausts.

Thus Oxy-Catalyst installations can not only control air pollution. They can also be used to release the latent heat energy in waste and process gases. And they can sometimes do both at once.

### A More Efficient Catalyst

The key to successful catalytic oxidation is, of course, the catalyst itself. Features which make the Oxycat unique are:

- The combination of platinum and alumina, chosen from hundreds of elements and compounds as the most active and long lasting catalytic agent
- The carrier, a high-grade porcelain selected for its strength, chemical inertness, and resistance to high temperatures



Oxycat installation on Standard Oil Company of California's phthalic anhydride unit at Richmond, Calif.

- The patented method of applying the catalyst to the carrier
- The patented mechanical design of the Oxycat itself

The result of this combination of features is a catalytic unit with exceptionally long life at high efficiency. Oxycats are strongly resistant to thermal shock—to contaminating agents and clogging. There's no problem of frequent cleaning or reprocessing. Oxy-Catalyst installations are still functioning at high initial efficiency after over 20,000 hours without maintenance or servicing.

### Already in Wide Use

Oxy-Catalyst installations are now working effectively in a wide range of industries

—oxidizing combustibles from such processes as asphalt oxidation; phthalic anhydride, polyethylene and ethylene oxide manufacturing; catalytic cracking; and many others.

Oxy-Catalyst installations are carefully engineered to your individual requirements, and our engineers, working with yours, can install Oxycats effectively in any existing plant. So, if air pollution is a problem in your operation—if irritating fumes and odors are costing you neighborhood good will—you should know that Oxy-Catalyst offers a practical, realistic answer to your problem.

Fill in the coupon, or write on your business letterhead, for complete information now.

## OXY-CATALYST, INC.

Industrial Division  
Wayne, Pa., U.S.A.



Fume Elimination Processes and Equipment  
Industrial • Automotive • Consumer Products

Oxy-Catalyst, Inc.  
Industrial Division, Wayne 6, Pa.

Please send me complete information on your catalytic oxidation process for air pollution control and waste heat recovery.

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Firm name

Street

City  Zone No.  State





AMA's Appley addresses the Academy of Advanced Management's first class in the management course.

## Management Training: Becoming a Must?

With chemical process companies\* having enrolled 10 out of the 53 executives in the management course beginning this week in the American Management Assn.'s one-month-old Academy of Advanced Management at Saranac Lake, N.Y., it's clear that this industry is taking seriously the concept of management as a profession and is making important investments of time and money in intensive managerial training.

In addition to the management course, chemical process company executives participate—in steadily increasing numbers—in the entire range of AMA activities.

That includes courses, orientation and workshop seminars, conferences, clinics, presidents' roundtables and

executive compensation service—but the management course, cost reduction, marketing executive action are the favorites (see table, p. 42).

**Big Business:** The demand for professional management training has made a big business of the educational organization dedicated to teaching better methods of management.

During fiscal '57 (ending June 30), for example, 773 AMA activities drew 75,000 registrants. Activities included 31 national conferences and some 600 workshop and orientation seminars.

The association's membership reached 25,000—about 20,000 company members (including 193 chemical process companies) and 5,000 individual members—and annual income topped \$6.5 million, an increase of 50% over fiscal '56.

**Management Skills:** The management course stands out in popularity among chemical process executives.

It's a four-week program of advanced instruction for executives in the principles, skills and tools of management.

The marketing course is a one-week program including product planning, marketing research, advertising and sales training.

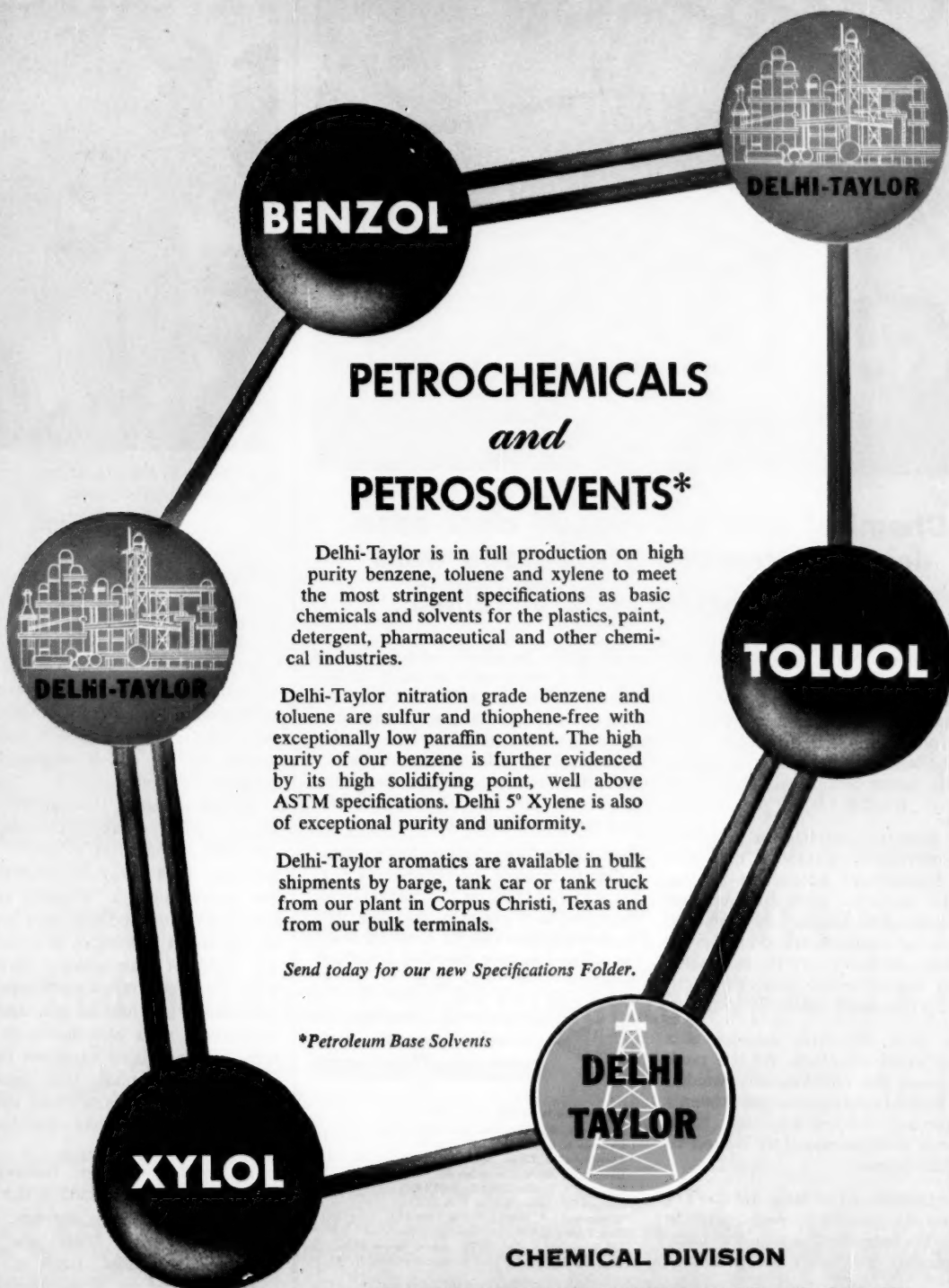
Cost reduction, a special one-week program, covers the entire field of cost reduction and control, while executive action deals with decision making, communication and morale.

The new academy is in the heart of the 5-million-acre Adirondack State Park. Formerly the Trudeau Sanatorium, it has 50 buildings on 90 acres, has classroom and residence accommodations for 125 registrants and office and working space for 75 full-time employees.

Reported to have cost AMA \$2 million, including renovation, the academy stands as a "monument to enlightened management philosophy

\*Ethyl Corp., Visco Products, American Potash & Chemical Corp., Murphy Corp., Westvaco Chlor-Alkali Division of Food Machinery and Chemical Corp., Prince Matchabelli and Extruded Plastics divisions of Vick Chemical Co., Liquifuels, California-Texas Oil Co. and Baxter Laboratories.





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Delhi-Taylor is in full production on high purity benzene, toluene and xylene to meet the most stringent specifications as basic chemicals and solvents for the plastics, paint, detergent, pharmaceutical and other chemical industries.

Delhi-Taylor nitration grade benzene and toluene are sulfur and thiophene-free with exceptionally low paraffin content. The high purity of our benzene is further evidenced by its high solidifying point, well above ASTM specifications. Delhi 5° Xylene is also of exceptional purity and uniformity.

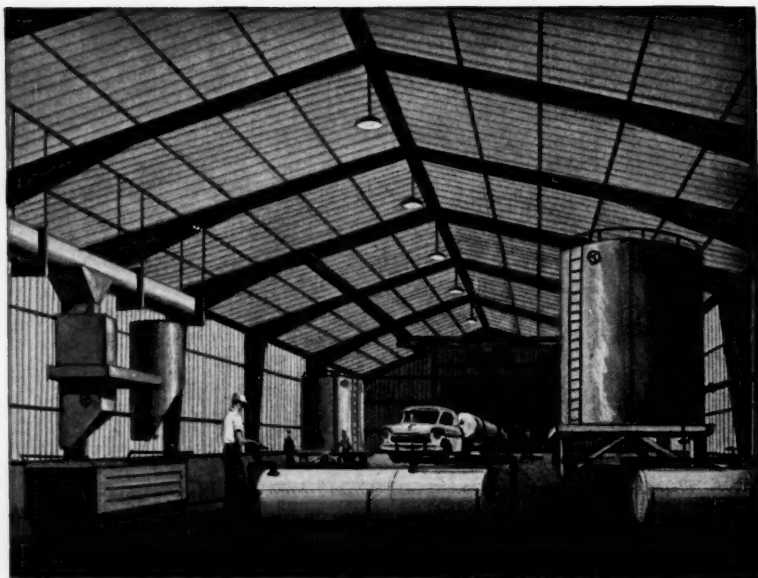
Delhi-Taylor aromatics are available in bulk shipments by barge, tank car or tank truck from our plant in Corpus Christi, Texas and from our bulk terminals.

*Send today for our new Specifications Folder.*

*\*Petroleum Base Solvents*

**CHEMICAL DIVISION  
DELHI-TAYLOR OIL CORP.  
415 Madison Ave. • New York 17, N. Y.**





## Chemical men get rugged clear-span design, attractive **Stran-Satin** walls with **NEW STRAN-STEEL BUILDINGS**

The open, clear-span design of Stran-Steel buildings makes them ideal for the large tanks, vats, and associated piping required for chemical processing operations. In addition, new Stran-Steel buildings have a look of quality never before achieved in an all-steel structure.

Start with the smart *Stran-Satin* finish. *Stran-Satin* metal wall, exclusive with Stran-Steel, provides a strong, durable exterior with the weather resistance of zinc-coated steel. Special protective coatings are available for extreme corrosive conditions. Peaks, gables and eaves are completely enclosed with smart fascia flashing.

Under this attractive exterior is a rugged steel structure. At the peak and knee, the continuously welded rigid frame I-section steel plate beams are securely bolted together. Each frame is also permanently bolted to the foundation.

New Stran-Steel buildings are quickly erected at minimum cost, provide clear, unobstructed space for large equipment, and may be provided

with such required accessories as overhead craneways or large access doors. With Stran-Steel buildings, you get the cost-saving features of a pre-engineered structure in a quality building that is fire-safe and easy to insulate. They are available in widths of 32, 40, 50, 60, 70, and 80 feet, and multiples thereof.

Up to \$25,000 is available to finance these buildings through the Stran-Steel Purchase Plan. As little as 25% initial investment; up to 5 years to pay. Ask your Stran-Steel dealer for the complete story. He is listed in your classified telephone directory.

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Kansas City, Mo., 6 East 11th St.  
Minneapolis 4, Minn., 708 S. 10th St.  
New York 17, N.Y., 405 Lexington Ave.  
San Francisco 3, Cal., 1707 Central Tower Bldg.  
Washington 6, D.C., 1025 Connecticut Ave., N.W.

Stran-Steel Corporation, Detroit 29, Michigan, Dept. 24-25

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## ADMINISTRATION



Wiretapping the reactions of decision-making executives.

and improved management practices."

During fiscal '58, 4,000 executives are expected to take part in 90 activities at Saranac Lake. Courses will include the management course, cost reduction, supervisory development, management course for presidents, orientation seminars, decision making, finance and the still-developing visual presentation course.

**Decision-Making Course:** The executive decision-making course—that received its test run in New York last May (*CW*, May 18, p. 30)—offers management a "scientific executive training method that goes beyond the advanced techniques now used in any field of management development." The course combines the case-history method of management orientation with stimulation in the form of reproduced situations (under controlled conditions) that occur in real life. This permits close analysis and study of executive reactions to business problems.

To make decision making as "scientific" as practical, AMA has outfitted one of the Saranac Lake buildings with the latest "spy" and "wiretap" apparatus. Each of four rooms used by the competing "companies" or teams has nine concealed microphones that transmit all sound through a central switchboard (see picture above) to any one of several conference rooms, and/or to a battery of tape recorders.

In addition, each team room has



**TOMORROW'S PRODUCTS TODAY...THROUGH ENJAY PETROCHEMICALS**



## **Basic ingredients for LATEX PAINTS that add that professional touch!**

With the modern trend of "do-it-yourself," easy-to-apply latex paints are a growing favorite with today's home-owners. Increased competition for a share of this rapidly expanding market makes it essential for manufacturers to obtain top-quality raw materials for their products.

Enjay Butadiene, like all Enjay petrochemicals, meets rigid specifications for purity and uniformity and is excellent for the manufacture of high-quality latex paints.

For technical assistance in the application of Enjay Butadiene or any other of the many Enjay petrochemicals to *your* product, the recently expanded Enjay Laboratories offer the industry's most modern testing and research facilities. Write or phone for complete information.

**Enjay offers a widely diversified line of Petrochemicals for industry:**

**ALCOHOLS & SOLVENTS:** Lower Alcohols, Oxo Alcohols, Ketones and Solvents; **OIL & FUEL IMPROVERS:** Detergent-Inhibitors, V-I Improvers, Oxidation-Inhibitors; **CHEMICAL RAW MATERIALS:** Olefins, Diolefins, Aromatics; **ENJAY BUTYL RUBBER & VISTANEX.**



*Pioneer in  
Petrochemicals*

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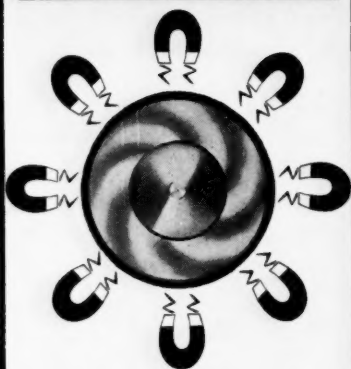
**November 2, 1957 • Chemical Week**



**NEW**

# Electromagnetic Whirl-Way PROCESS

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## ADMINISTRATION

### CPI Executives' Favorite AMA Courses

Course or seminar	Process companies participating	Process company registrants	Total registrants	Period covered
Cost reduction	29	61	600	'55-'57
Marketing	35	54	300	'55-'57
Executive action Management	20	29	207	'57
	67	408	3,500 (graduates)	'52-'57

an adjacent observation booth equipped with one-way glass from which instructors can see and hear team members at work.

Summing up the increasing importance of professional management

training, Lawrence Appley, AMA president, predicts, "The time will come when companies will require a man to have certain accredited management training before adding to his responsibilities."



## Engineers Map New Bargaining Group

Next step toward formation of a new collective bargaining organization for engineers and other professional-grade employees is scheduled for Feb. 8-9 in New York, when it's expected that delegates will adopt a constitution to be submitted to prospective member units. Meeting in Los Angeles last fortnight, chairman Charles Hall (*third from left*) and

other members of the steering committee of the proposed Engineers & Scientists Guild agreed on the spirit of the language to be used. The preamble calls for proper and effective representation for all "members of the engineering community"—itemized as engineers, scientists, architects, draftsmen, technicians and allied engineering employees.



## SPECIALTY MARKET BUILDERS (from Monsanto) . . . . .



Keeping volatile insecticides working much longer is a growing job for

## Aroclor 5460: MAKING NEW SPECIALTY MARKETS FOR INSECTICIDES

A smart formulating trick that has laid dormant on the shelf for three years now promises some profitable specialties. The opportunities first came to light when U. S. Department of Agriculture scientists reported that chlorinated polyphenyls lengthened the kill-life of volatile insecticides (CW Aug. 14, 1954). Since then, commercial researchers have been nibbling into the enormous possibilities. To date little has been published on the commercial exploitation in specific applications. Most research has been along broad "screening" lines, such as the resin's effect on the staying power of a wide variety of pesticide compounds, and spot checking on conditions of use.

Despite the fact that most of the results have been highly promising, apparently no commercial formulator has yet seized on non-crop uses—which offer the most logically and immediately profitable applications.

As an example, under research conditions it was shown that a sprayed-on mixture of 25% lindane, 25% Aroclor 5460, and 50% solvent enabled the treated surface to kill house flies for a period of 102 days... *ten times longer* than the same dosage without Aroclor! On cockroaches, a lindane-Aroclor mixture, used at the rate of 50 mg. lindane per square foot under experimental conditions, still registered an 80% kill after 60 days. Straight lindane solution, same

rate, same conditions, scored only a 4% kill.

Enterprising specialty marketers are just becoming aware of the possibilities. For improved fly killers alone, there is an enormous market: Count up dairy barns, soft drink bottling plants, commercial dairies, and packing houses where flies are anathema. A twice-a-season spray of walls, ceilings, and out-of-the-way surfaces could contribute enormously to fly control.

Specialty consumer products offer still other possibilities. Local pest-control programs are on the upswing. It has been proved that, with concerted effort, a community can vastly cut down, if not practically free itself from, rat and mosquito populations. Just how far local, community-wide *fly-control* programs can be stimulated by progressive insecticide formulators is anybody's guess. But a juicy specialty market might be developed with simply a 6-oz. dauber bottle of lindane-Aroclor concentrate for painting the underside and rims of garbage can lids. Repelling or killing the flies would automatically control maggot breeding. Door and window screen sprays and shrub sprays are another possibility. A lindane-Aroclor aerosol sprayed on a willow tree continued to kill flies after two months of outdoor exposure, with no apparent injury to the foliage. How safe the "bonded on" insecticides are to shrubs, however,

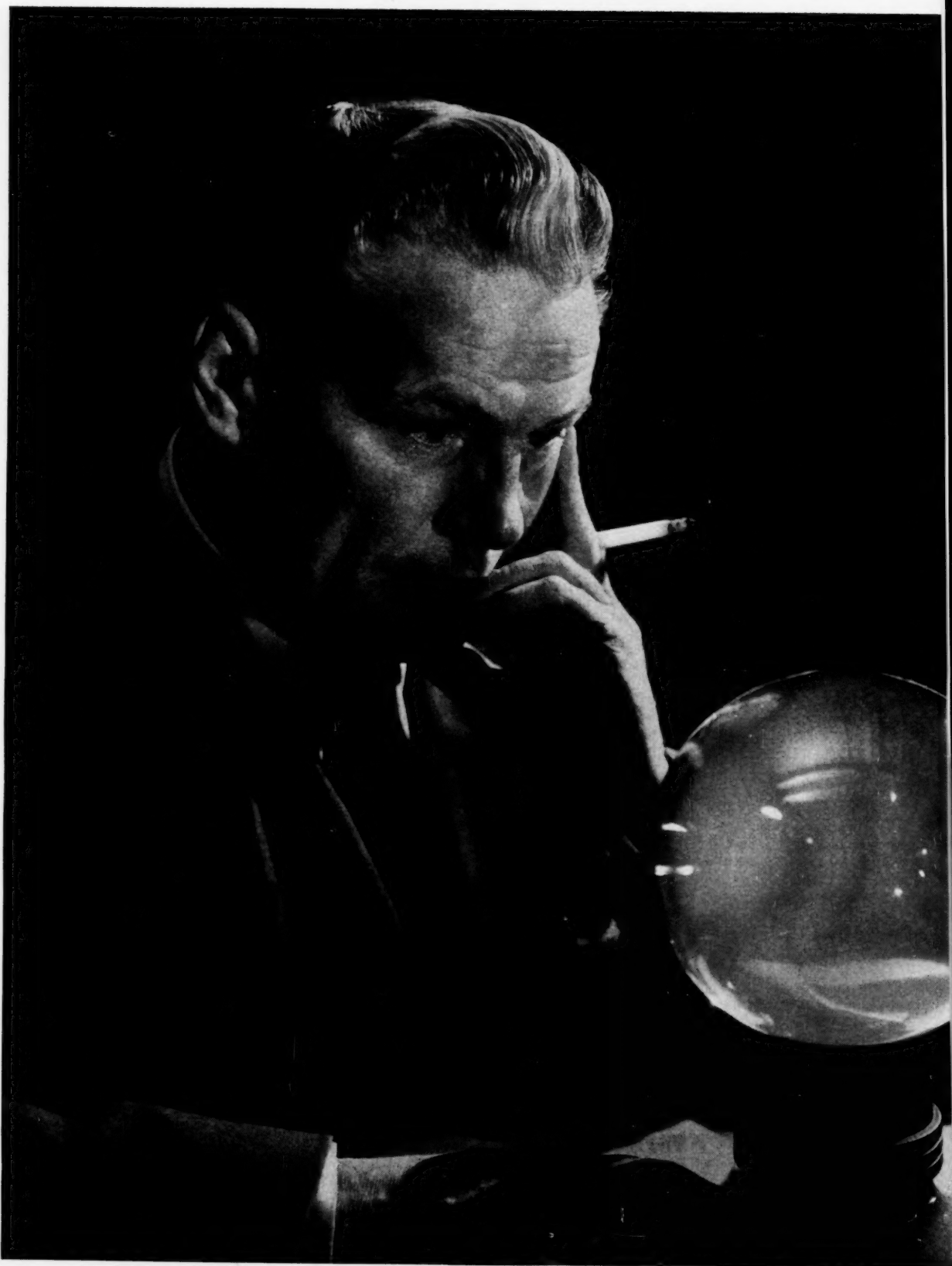
awaits investigation. But thousands of suburban householders would welcome a control agent for spider mites that breed in foundation plantings.

Possibilities for profitable applications are enormous for formulators who will undertake the necessary development. Aroclor 5460 resin imparts "staying power" to a number of chlorinated insecticides, including heptachlor, chlordane, and aldrin. As a "bonding" agent for insecticides, Aroclor 5460 is low in cost. The transparent, yellow resin is soluble in a variety of solvents. Further, Aroclor 5460 bonds tightly to metal; is easy to handle and formulate. It is relatively nonvolatile, nonflammable, nonoxidizable; shows no primary skin irritancy or sensitization. For particular uses, such as insect traps or tapes, other Aroclors (Monsanto produces seven) might be substituted: Aroclor 4465, for example, gives a very tacky surface; Aroclor 1254 provides a "wet" surface; etc. All are chlorinated terphenyls with interesting variations in physical properties.

Aroclor: Reg. U. S. Pat. Off.

For further information, write on your company letterhead requesting a copy of: Specialty Data Report S-6, *Aroclors for Insecticide Formulation*. Monsanto Chemical Company, Department CS-6, Organic Chemicals Division, St. Louis 1, Missouri.





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# YOU WON'T FIND THE RIGHT PLURONIC LOOKING IN A CRYSTAL BALL

But there is a sure, easy way. It saves laboratory time . . . suggests in advance the characteristics you can get. Read how:

The PLURONIC\* Grid lets you dispense with crystal-ball chemistry in selecting the block-polymer with the right surface-active or chemical properties.

With the Grid, random evaluation is eliminated. All you do is determine the characteristics you want, and choose the PLURONIC that suggests the best combination of properties for your product . . . then start formulating.

After a few laboratory tests, you can pinpoint the PLURONIC grade or combination of grades which offers you the most desirable properties and distinct competitive advantages.

In many cases, this has proved to be the only necessary step. Numerous new and important advantages in using the PLURONICS have been reported from many industrial fields following this procedure.

In the making of paper, for example, the viscosity of starch-adhesive coating colors containing 63% solids can be reduced 20% to 25% by the addition of PLURONIC L62. The viscosity of starch-latex coating colors containing 63% solids can be reduced 30% to 35%.

Consequently, higher viscosity starches can be used with higher pigment loading in the paper coating, without increasing coating-color viscosity.

If, after laboratory tests, you feel further improvement is possible, send us your results and we'll work with you from there. It may be that we have important new application data that will be useful. Also, new additions to the PLURONIC series, which we are adding from time to time, may prove helpful to you.

Makes sense, doesn't it? So why not send for your copy of our PLURONIC Grid today. Or, if you already have a Grid, the necessary samples are available upon request.

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MICHIGAN ALKALI DIVISION



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November 2, 1957 • Chemical Week



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These non-polar hydrocarbon oils, once used principally in drug and cosmetic products, now are employed in a surprisingly broad range of applications. Their unique combination of properties makes them effective as anti-caking, anti-dusting and detackifying agents; as reaction media, special lubricants, aliphatic raw materials, extractants, water repellents and related products.

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## ADMINISTRATION



WIDE WORLD

Texas Atty. Gen. Wilson: Fighting for state control of natural gas.

## LEGAL

**Gas Battle Victory:** Although a chemical-industry-favored bill to remove natural gas pricing from control of the Federal Power Commission made little headway in Congress last session (*CW*, June 8, p. 22), Texas appears to have won a recent round for state control.

The Texas supreme court recently rejected appeals in two cases attacking Texas Railroad Commission's orders regulating production from the Puckett-Ellenberger field in Pecos County. Losers were Permian Basin Pipeline Co. and Phillips Petroleum, principal producer in the field. Atlantic Refining Co. sided with the commission.

Permian Basin Pipeline, a subsidiary of Northern Natural Gas Pipe Line Co., made a contract to buy gas from Phillips Petroleum. The gathering company also agreed to build a processing plant, mainly to remove the large quantity of carbon dioxide found in the natural gas.

Atlantic Refining, owner of one well in the field, asked the pipeline company to take its gas, too, but the plant agreed to do so only when facilities were not needed to fulfill the Phillips contract. Dissatisfied, Atlantic appealed to the commission.

The commission declared Permian Basin to be a "common purchaser" in the field, and ordered it to buy and process gas from all wells.

Texas Attorney General Will Wilson said that "Phillips and Permian



# 'Major Potential' for Tank-Car Builders Is Maximum-Load Cars, Says ACF Official

J. P. Krumech Tells National Petroleum Ass  
For High-Pressure Commodities Are Possibl

... That Such Cars  
... Fleets.

Oil Daily, Sept. 13

## Rising Trend to Large Capacity Tank Cars Cited at NPA Parley

ATLANTIC CITY, Sept. 12—J.  
P. Krumech, vice president of Ship-  
pers' Car Line division, ACF Indus-  
tries, Inc., today told the trans-

The ACF official acknowledged  
that there are some  
for oil companies

### New High-Pressure Tank Cars Expected to Be In Production Shortly

... the  
... be  
... al-

By a WALL STREET JOURNAL Staff Reporter  
NEW YORK—Larger, maximum-load tank  
cars for high-pressure commodities—liquefied  
gases—will soon be out of the development  
stage and in large-scale production, according  
to J. P. Krumech, vice president in charge of  
sales of Shippers' Car Line division of ACF In-  
dustries, Inc.

Wall Street Journal, Sept. 13

Four points that made news highlighted the  
talk given by QCF Industries' J. P. Krumech  
at the National Petroleum Association's  
annual meeting in Atlantic City on Sept. 12.

1. Money-saving maximum-load railroad  
tank cars for many commodities are  
available now;
2. For petroleum products, 19,000-gallon  
cars with 90 per cent greater lading  
capacity than 10,000-gallon cars cost  
only 27 per cent more;
3. For high-pressure commodities (lique-  
fied gases), 20,000-gallon cars are  
practical and are now in the develop-  
ment stage;
4. Uninsulated tank cars (only recently  
approved by the ICC for high-pressure  
loadings) cost less and carry more.

A qualified leader of today's trends, QCF  
has built maximum-load tank cars for  
heavy low-pressure commodities since 1929  
... maximum-load cars for petroleum prod-  
ucts since 1953 ... uninsulated cars for high-

pressure commodities since July of this  
year. QCF has delivered more King Size  
fuel-oil tank cars than any other manu-  
facturer, and continues to advance its  
research on maximum-load tank cars for  
high-pressure commodities.

Additional information is available at:



**SHIPPERS' CAR LINE**  
DIVISION OF QCF INDUSTRIES  
INCORPORATED

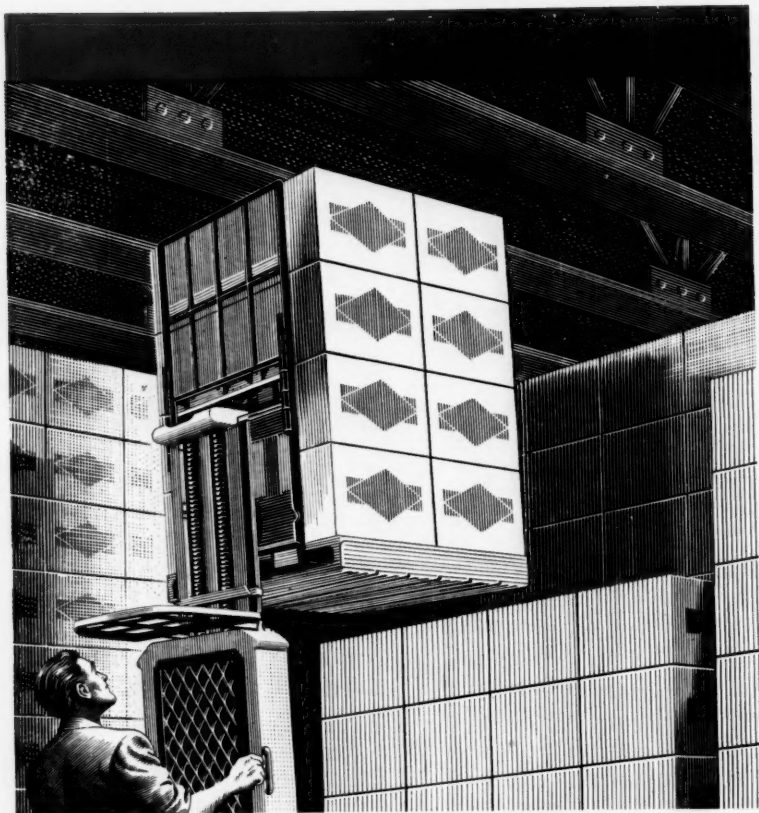
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19,000-GALLON QCF KING SIZE TANK CAR for petroleum products  
(right) has 90 per cent greater capacity than standard car, costs 27 per cent more.







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*For information on containers to help you make full use of all your storage space, call your nearby Gaylord office.*

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS

## ADMINISTRATION

have cooperated in excluding all other producers of gas in the Puckett-Ellenberger field" from their only market.

Appeal may be made to the U.S. Supreme Court citing that court's Phillips gas case ruling giving FPC regulatory power over gas production.

**Fungicide Patent Protected:** Federal district court of West Virginia has enjoined Roberts Chemical (Nitro, W. Va.) from continued infringement of the patent under which Rohm & Haas Co. sells its Dithane-brand fungicide.

Roberts is enjoined from making, using or selling any fungicide composition having as an active ingredient nabam, zineb or any other salt of an alkylene bisdithiocarbamic acid.

A year ago, the R&H patent was declared invalid and not infringed in district court, but a U.S. court of appeals reversed the decision.

## IDEAS

**Engineering Management Clinic:** "Improving the organization and performance of an industrial engineering department" is the subject of the fifth annual fall management clinic sponsored by the Montreal chapter of the Society for the Advancement of Management. Vice-Director Marvin Mundel, of the management center at Marquette University (Milwaukee), will conduct the clinic, in the Queen's Hotel, Montreal, Nov. 22.

**Use of Chemical Literature:** The library committee of the Chemists Club of New York has launched a series of symposiums on most efficient use of chemical literature. Coinciding with the committee's annual drive for funds to expand the club's library of more than 50,000 volumes, the series began with a session on "information and library techniques."

**New Books for Management:** Two books on human relations in industry, written by business executives, and National Office Management Assn.'s 13th annual bibliography of books relating to office management have just been published. The books: "Big Business and Human Values," by Theodore Houser, chairman of the board of Sears, Roebuck & Co.; and "Making Management Human," by Alfred Marrow, president of Harwood Mfg. Corp.



# Using Salt Efficiently

by **INTERNATIONAL SALT COMPANY, INC.**—America's largest producer of salt



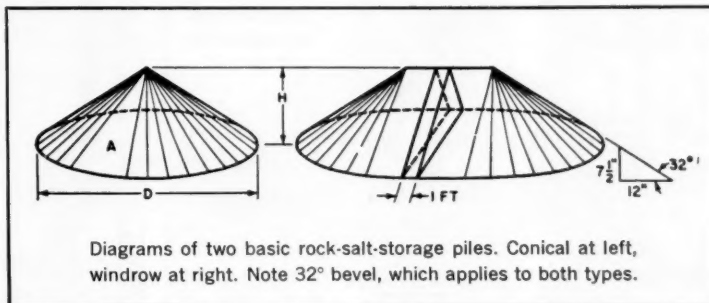
## How to Determine Space Needs for Rock Salt Storage

**Today**, salt-using companies often have the problem of determining how much area and volume are needed to store a given amount of rock salt. To help the companies faced with this situation, International has developed a system for determining the exact floor space (or plant area) needed for any tonnage of salt. In addition, it is possible with this system to select the shape of salt pile best suited to individual plant layouts.

**Principles of salt storage.** International's system is based on two known facts: first, one cubic foot of rock salt (loosely poured and medium-packed) contains a constant average of 72 lbs. of salt. And, second, every conical pile formed by pouring rock salt from a fixed overhead point assumes the same shape.

Referring to the diagram, you will note that this shape is a perfectly conical one, with an angle of repose of  $32^\circ$  from the horizontal. In other words, for every 12-inch horizontal run, there is a  $7\frac{1}{2}$ -inch rise. With these basic principles, therefore, it is possible to determine just how large a pile will be formed by any tonnage of rock salt.

**Tables give complete area and volume data.** For the convenience of salt-using companies, International has prepared a comprehensive set of tables with all the storage-space data for amounts of salt ranging from three to 23,000 tons. With these tables, for example, you can quickly



Diagrams of two basic rock-salt-storage piles. Conical at left, windrow at right. Note  $32^\circ$  bevel, which applies to both types.

find exactly the amount of space needed to store 3,000 tons of rock salt. (The answer is a single, conical pile 100 ft. in diameter at the base, and 31 ft. high.)

In many plants, however, it is not possible to store salt in one large, conical pile. Instead, it must be stored in a lower, longer, windrow-shaped pile. In this case, International's computations on storage-space requirements apply equally well. The data in the tables permit you to select the height or length of windrow pile best suited to your plant needs.

Again taking the example of 3,000 tons of salt: It can be poured from a portable conveyor belt into a pile 65 ft. wide at the base, 20 ft. high, and 100 ft. along the crest. Or, if such a pile doesn't suit your plant needs, the same tonnage can be stored in a pile 75 ft. wide at the base, 23 ft. high, and 55 ft. along the crest.

**Easy way to check tonnage of any salt pile.** A problem often encountered by salt-using companies is how to determine the amount of salt in a given storage pile. Here again, International's complete tables will quickly give the answer. Because each measurement in a symmetrical salt pile bears a fixed relation to every other, it's possible to find every measurement when only one is known. Thus, a conical pile 16 ft. high will contain 368 tons of salt.

There is still another way in which International's salt-storage tables are helpful. If you want to cover an outdoor pile with tarpaulin or tar paper, you can easily find the surface area of the pile. For example:

the surface area of a conical pile 45 ft. in diameter is 1,870 sq. ft. These comprehensive tables are included in a booklet, "Brine for Today's Industry," which will be sent to you at your request. Simply contact International.



### TECHNICAL SERVICE WITH YOUR SALT

Through skilled and experienced "Salt Specialists," International can help you get greater efficiency and economy from the salt you use. International produces both Sterling Evaporated and Sterling Rock Salt in all types and sizes. And we also make automatic dissolvers in metal or plastic for both kinds of salt. So we can recommend the type and size of salt most perfectly suited to your needs.

If you'd like the assistance of an International "Salt Specialist" on any problem concerning salt or brine—or further information on space needs for rock salt storage—just contact your nearest International sales office.

#### International Salt Co., Scranton, Pa.

Sales Offices: Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N. J.; Buffalo, N. Y.; New York, N. Y.; Cincinnati, O.; Cleveland, O.; Philadelphia, Pa.; Pittsburgh, Pa.; and Richmond, Va.

#### DATA GIVEN IN INTERNATIONAL'S SALT-STORAGE TABLES

Given any amount of rock salt, from three to 23,000 tons, you can find these storage-pile measurements at a glance:

1. Height.
2. Base Diameter.
3. Base Area.
4. Surface Area.
5. Volume.

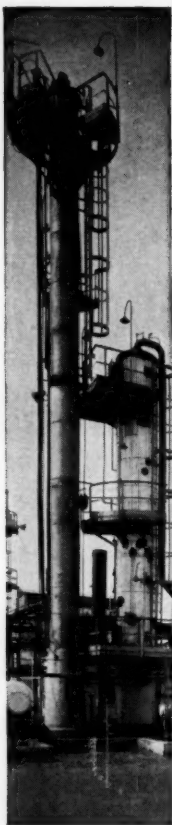
The same data apply to windrow segments. And because each measurement bears a fixed relation to every other, you can find every windrow measurement if you know just one.

FOR INDUSTRY, FARM, AND THE HOME—

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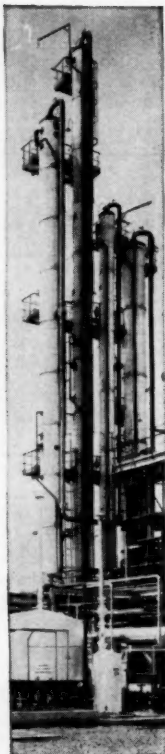
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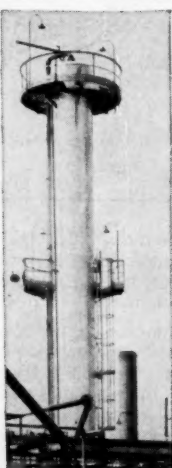


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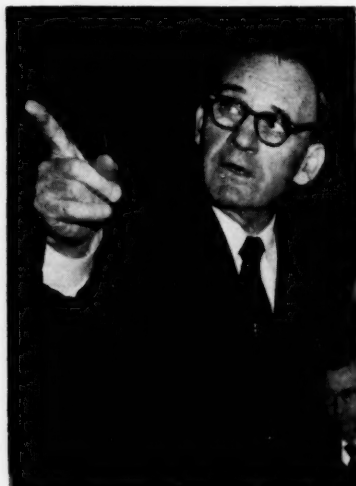


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## ADMINISTRATION



INTERNATIONAL NEWS

Senator McClellan: He plans to precipitate 1958 Taft-Hartley clash.

## LABOR

**Labor Battle Looms:** For the past 10 years, Congress has side-stepped any serious move to make fundamental changes in the Taft-Hartley law, but it now appears that next year's session will be marked by a pitched battle over proposals for overhauling that act. Sen. John McClellan (D., Ark.)—whose special Senate committee has turned its attention to alleged improprieties on the part of business executives, after having spent most of this year looking into corruption on the part of union officers—says that he's planning to start things moving on labor law revisions. Early in the 1958 session he plans to make preliminary recommendations, based on his committee's 1957 hearings. McClellan predicts that this time, Congress will not shrink from (a) making labor unions subject to antitrust laws and (b) enacting a national "right-to-work" law. He has indicated that he'll propose specific legislation relating to regulation of pension and welfare funds.

• **Multiplant Action:** Oil, Chemical & Atomic Workers Union (AFL-CIO) is telling its members that industry management men who object to company-wide bargaining are taking a "double-standard" attitude. OCAW says this is demonstrated in the current dispute at the East St. Louis, Ill., refinery of Socony Mobil Oil Co., with the company supplying its cus-



# Stepan **Methyl Esters**

The new Stepan plant at Millsdale, Illinois (near Joliet), includes a high capacity methyl esters production unit. This unit, of the very latest design, is now producing a wide range of methyl esters from coconut oil of high purity and excellent uniformity. These products, as intermediates, offer you interesting possibilities for improving your product or products.

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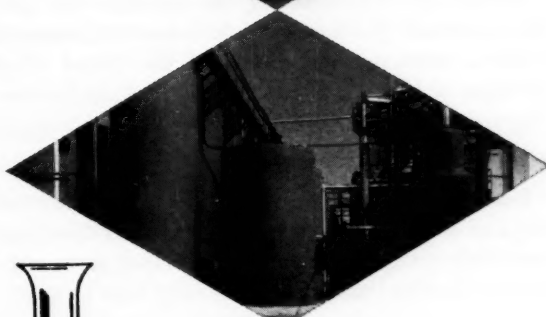
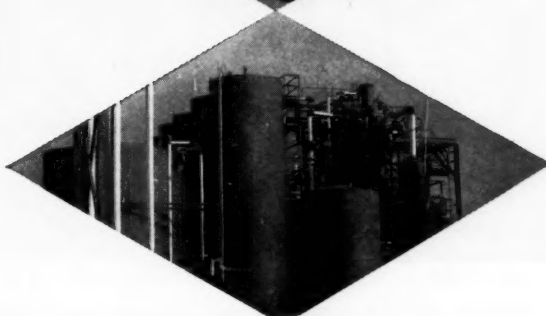
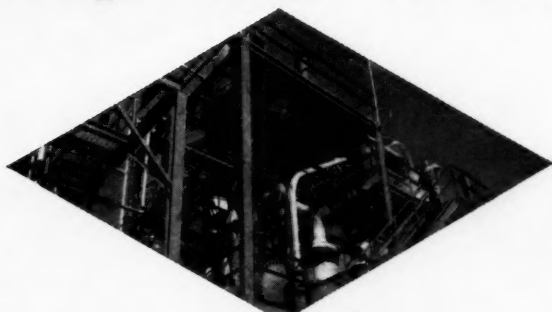
<b>Detergents</b>	<b>Resins</b>
<b>Emulsifiers</b>	<b>Lubricants</b>
<b>Wetting Agents</b>	<b>Plasticizers</b>
<b>Stabilizers</b>	<b>Textile Specialties</b>

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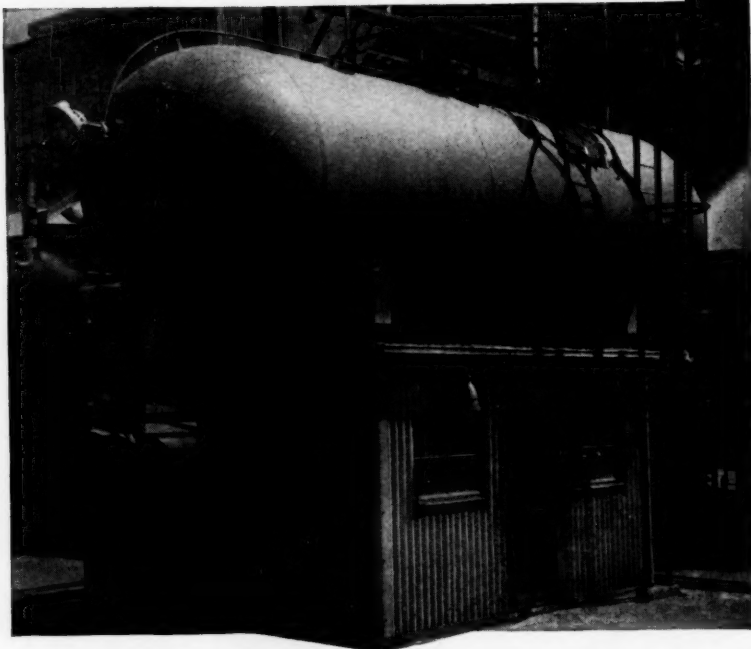
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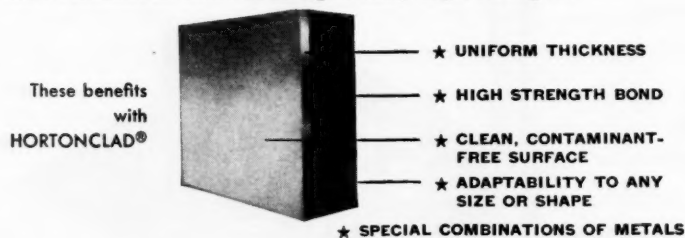
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## ADMINISTRATION

tomers from its 11 other refineries while the East St. Louis plant is shut down. "If an oil company can use national power and resources to defeat a local strike," the union declares, "... the employees should have a comparable counterpower."

## KEY CHANGES

**Jerome J. Van Gasse**, to general manager, Pfizer Laboratories Division; and **Conrad G. Hurlimann**, to director and vice-president, Pfizer International Subsidiaries; Chas. Pfizer & Co. (Brooklyn, N.Y.).

**A. L. Schultz**, to manager, rubber and rubber chemicals development, Development Center (Avon Lake, O.), B. F. Goodrich Chemical Co.

**James J. Sodaro**, to director of research, Rowe Products (Niagara Falls, N.Y.).

**H. S. Richardson, Jr.**, to president; **E. L. Mabry**, to board chairman and executive personnel committee chairman; and **H. R. Marschalk** and **E. P. Anderson**, to executive vice-presidents; Vick Chemical Co.

**R. P. Trauth**, to manager, Chemical Division, Darling & Co. (Chicago).

**C. F. Fogarty**, **Edward C. Meagher** and **Emile F. Vanderstrucken, Jr.**, to vice-presidents, Texas Gulf Sulphur Co.

**Albert E. Cleghorn**, to president, National Aniline Division, Allied Chemical & Dye Corp.

**Frederick L. Bissinger**, to group vice-president—marketing and research, Industrial Rayon Corp. (Cleveland).

**Fred C. Grant**, to vice-president and director of sales, Crown Chemical Corp. (Providence, R. I.).

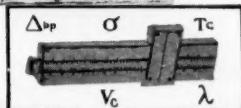
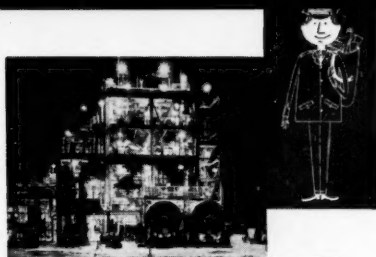
**J. R. Carlson**, to sales manager, Jefferson Chemical Co.

## DIED

**Hugh Reynolds MacMillan, Jr.**, 53, vice-president of manufacturing and director, Colgate-Palmolive Co., at Springfield, N.J.

**Alfred J. Liebmann**, president, Schenley Research Institute, Schenley Industries, at New York.





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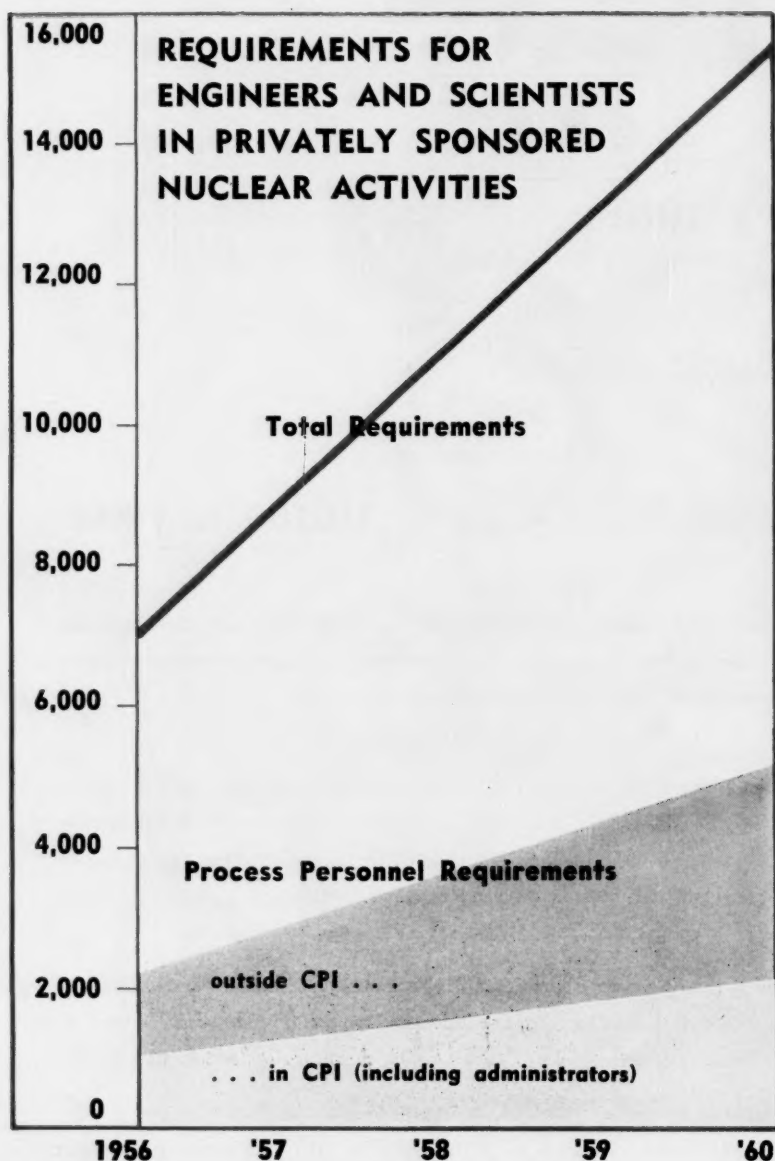
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# ENGINEERING



## Atoms Raid CPI Manpower

Firms in the process industries face heightened competition for atomic engineers and scientists in the next three years (see graph above). According to a survey recently conducted by Atomic Industrial Forum (New York) for Atomic Energy Commission, the demand for atomic personnel employed in the infant private nuclear industry will about double by 1960.

Key survey points for process industry firms:

- The responding companies indicate that there is not now a critical shortage of nuclear personnel for privately financed work. But they emphasize the rapidly growing demand, which may lead to such shortages even before '60.
- Demand for personnel usually

associated with the process industries is about double the total demand in the process industries themselves.\* This means that nonprocess firms are thoroughly in the market for that type of employee. This fact has been true to a certain extent in the past, looks as though it may become even more significant.

• Requirements of all firms for process personnel are rising even faster than for atomic engineers in general, will more than double by '60. And the gap between process personnel needs and the number taken by the process industries is widening (dark red area, graph). As a result, process companies (both in and out of the nuclear industry) will find increasing competition for new graduates in process industry fields.

**Total Is Now 9,000:** The survey indicates that in '56 about 7,150 engineers and scientists were working on privately sponsored nuclear activities and that now there are about 9,000. Of the 7,150, some 1,030 were employed by companies identified as process industry companies. However, total nuclear utilization of process personnel came to 2,150. Corresponding estimates for '60; 16,000 total, 2,100 in the process industries and about 5,000 "process-type" personnel in all.

Reliability of the survey should be high, since every firm known to be active in—or even contemplating—atomic work was contacted. Replies came from 280, including 49 of the 50 considered by AEC to be most active. Figures reported by these companies were estimated by AIF to represent about 75% of the total employment of such personnel and were accordingly adjusted upwards. Characteristics of the men themselves and of the work they do were both covered in the questions asked.

**Almost Half on Part-time:** A significant point revealed by the survey is that only 56% of the atomic personnel employed are spending all their time on nuclear activities. The part-time 44% may prove to be invaluable in helping meet part of the future de-

\*Survey categories classified by CW as process industries are manufacturers of chemicals and allied products, manufacturers of petroleum products and mining and primary metal industries. Job categories considered as process jobs are chemical, nuclear, metallurgical and mining engineers, chemists, biochemists and radiation chemists.





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ENGINEERING

mand without requiring the company to hire all new men.

The most common job proved to be that of mechanical engineer, held by more than twice as many men as the second-highest job, that of technical manager. Electrical engineers and physicists were also more numerous than chemical engineers, the leading process industry job.

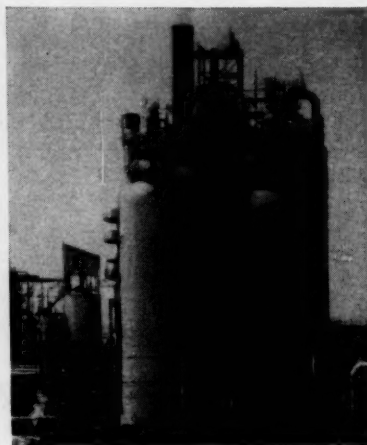
The degree level of the personnel covered is predominantly bachelor and master (total of 77%). Twelve percent hold doctor's degrees, while 11% have no degree, although they are doing work equivalent to that done by college graduates. (The technician level was not included in the survey.)

In terms of experience, the men employed in private nuclear work are behind those in other fields—a natural situation in a new industry. Whereas 85% of them have more than three years' total professional experience,

only 39% have served that long in atomic energy work.

And they are even weaker in specialized atomic energy education, with only 11% holding degrees in that field. [But, as Catalytic Construction's Raymond Vener points out (*CW*, March 9, p. 57), there is really no distinct nuclear discipline; it's still a specialization of established fields of engineering and science.] Another 23% have had at least a short course, but two-thirds of the total have had no formal atomic training. Many of the companies see an immediate need in this area, ask for a greater number of specialized courses.

**Power Reactors Lead:** Top manpower-requiring activity in the nuclear field is work on power reactors. About 2,000 scientists and engineers are kept busy on these projects, compared with 1,100 for the next-best-populated field, nuclear fuels. Other activities em-



Scanning-Camera Pictures Heat

Both of these pictures were taken in broad daylight with ordinary film. The difference is that one picture records light; the other, heat. Taken with a Barnes Far Infrared Camera (new product of Barnes Engineering Co., Stamford, Conn.), the picture at the right indicates actual surface temperatures of the refinery towers shown at the left. Like the infrared-sensitive Evaporograph (*CW*, March 3, '56, p. 56), Barnes' far-infrared technique enables refinery operators to detect hot spots in equipment. In addition,

it produces a quantitative record that can be calibrated, translated directly into degrees of temperature.

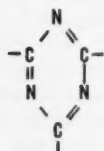
The Barnes camera consists of a scanning mirror that reflects the infrared radiation from points in the field of view onto an ultrasensitive, fast-acting detector (system responds in 1 millisecond to changes as small as 0.02 C). A light beam, originating within the camera, is modulated by the changes in detected radiation and is scanned across the light-sensitive film to create the photographic image.



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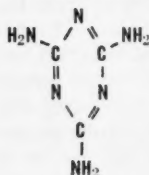
## Stability ... Plus!



The unusual stability associated with melamine resins is shared by a great many triazine derivatives. As a result, they perform well under rugged reaction and application conditions. In plastics, adhesives, coating resins, textiles, leather, dyes, rubber and pharmaceuticals, triazines have become well established as components or additives. We think they are well worth your investigation.

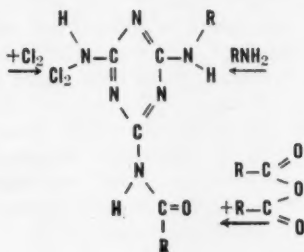
## Aero\* Melamine

(2,4,6-triamino-1,3,5-triazine)

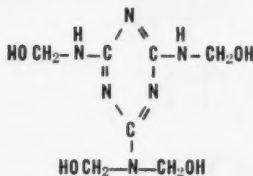


Most of melamine's reactions involve one or more of its six replaceable hydrogens. *Amines*, for example, react to produce alkyl-substituted melamines with the elimination of ammonia. *Dimethylsulfate* readily gives a methyl isomelamine salt which may be isomerized to methyl melamine.

*Acid Anhydrides* will give acyl melamines, usually going to trisubstitution. *Formamide* is the best route to the monoacyl derivative, formylmelamine. *Epoxides*, such as ethylene oxide, yield melamine condensates with polyether chains that contribute to water solubility.



Well known are the condensation polymerization possibilities of melamine after reaction with *formaldehyde* to form methylolmelamines. However, a relatively virgin field for development work is the utilization of the reactive methylolmelamines as intermediates. They may be etherified by reactions with alcohols, and analogous derivatives are obtained with mercaptans. Amines give aminomethyl derivatives.



(a typical methylolmelamine)

*The Chemistry of Melamine*—yours for the asking via our coupon—contains 52 pages of information on properties, reactions and applications.

## Aero\* Cyanuric Chloride

(2,4,6-trichloro 1,3,5-triazine)

The chlorine atoms are centers of high reactivity in cyanuric chloride and may be reacted selectively. The rate and degree of reaction depends on various factors including solubility, temperature and the nature of the nucleophile involved.

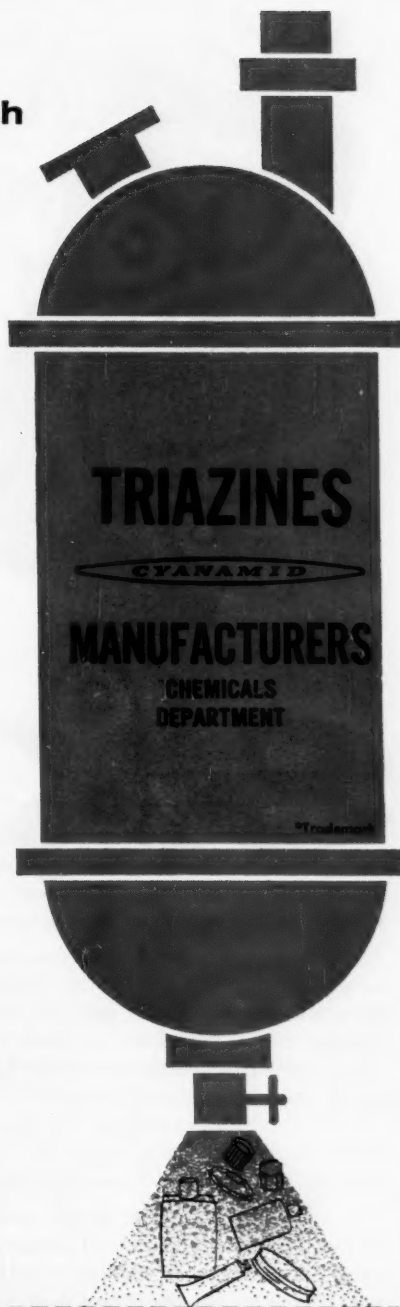


*Alcohols* and *phenols* can be reacted under controlled conditions to give selective yields of mono-, di- or trialkoxy derivatives. *Mercaptans*, in the presence of alkalis, yield trithiocyanurates. *Amines* and related compounds react stepwise at increasing temperature ranges to replace progressively the three chlorines. *Arylhalides*, with sodium, effect an aryl substitution on the ring carbons. Friedel-Crafts reactions with  $AlCl_3$  also produce triaryl triazines.

A 44-page Cyanamid bulletin, *Cyanuric Chloride*, gives all the information. Again we direct your attention to the coupon.

## A Few Triazine "Comers"

Our New Product Development Department is actively evaluating and promoting a few newer members of the triazine clan. *Cyanuric Acid* is offered as a handy triazine intermediate. *Diallylmelamine* and *tri-allyl cyanurate* are showing particular promise as comonomers in plastics. Our New Product group has done a bang-up job of collating data relevant to reactions and applications and if you are interested in these variants of the triazine family, we suggest you contact them directly. Same address.



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Research scientists have known for some time that solvent extraction—SX to the initiated—was theoretically the best known method of wresting uranium from the tough ores of the Colorado plateau. But it remained for Vitro Uranium Company to apply the process on a practical scale. Its Salt Lake City mill and the Vitro Rare Metals processing plant at Canonsburg, Pa., are among the first to use this efficient high-recovery process. For this, and similar accomplishments, Vitro will share in the 1957 *Chemical Engineering Achievement Award*.

Conversion of its plant to SX is an excellent demonstration of Vitro's know-how across the spectrum of modern technology. Engineers from Vitro Engineering Company, scientists from Vitro Laboratories, and construction specialists from The Refinery Engineering Company joined with Vitro Uranium Company and Vitro Rare Metals Company to build this better mousetrap, uranium style.



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## ENGINEERING

playing at least 500 technical men are reactor components, research reactors, reactor materials, by-product applications and instrumentation.

Also reflecting the fledgling nature of the industry is the stage of the work of most of the engineers. Some 5,000 of the total are engaged in research and development and design engineering; only 900 are in operations, production and manufacturing.

But the industry is growing up fast, and the need for new men will be a matter of vital concern in coming years. To the question of what to do about it, process firms hear at least one answer: make the most of the men they already have.

## PROCESSES

**Aluminum Soldering:** Bell Telephone Laboratories (New York) has developed successful new fluxless techniques for soldering aluminum and its alloys as well as galvanized metals. The solder used is a high-purity zinc alloy containing a fraction of a percent of magnesium for stability and up to several percent of aluminum. Rigidly excluded are lead, tin, bismuth and cadmium. Simply touching the solder stick to the heated aluminum surface allows penetration of the oxide layer. The solder alloys with the metal surface and raises the oxide so that it can be wiped away. A joint that is stronger than the aluminum itself can be made by bringing together two surfaces prepared in this way and applying more solder and heat.

**Process Swap:** Catalin Corp. of America (New York) and Cie. Centrale Rousselot (Paris) have signed a five-year license agreement to exchange technical information. Areas covered by the pact include manufacture of solid one- and two-stage phenolic resins for adhesives, bonding, molding and foundry uses.

**H-Iron Process:** Alan Wood Steel Co.'s new 50-tons/day iron powder plant at Ivy Rock, Pa., will use Hydrocarbon Research's H-iron process (*CW*, Jan. 26, p. 96). A fluid-bed process aimed at allowing iron makers to bypass the blast furnace, the method consists of reducing the ore with hydrogen at 400 psi. and 900 F. Alan Wood will get hydrogen from its coke-oven gas plant next door.



## A tall, dark industrial chimney or smokestack dominates the foreground. It has a cylindrical body with a conical section near the top, which is capped with a complex lattice or cage-like structure. Several smaller, similar lattice structures are visible on the side of the main shaft at different heights. In the background, a city skyline is visible, including a prominent building with a grid-like facade on the left and another tall, lighter-colored chimney on the right. The overall scene is in black and white, with a high-contrast, somewhat grainy aesthetic.

The continuous production of high octane gasoline by catalytic reforming demands sturdy, efficient, soundly designed equipment. This is especially true of furnaces.

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PERMOBOND COVERINGS



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# Technology

## Newsletter

CHEMICAL WEEK  
November 2, 1957

### Release of deuterium that was being irradiated under pressure

in the Windscale atomic reactor may have been the cause of the reactor accident there (*see also p. 22*). A report published by the Manchester Guardian said that while deuterium was being irradiated to produce tritium, the temperature of the reactor had been raised to anneal its graphite cores—a routine maintenance task. According to this report, this caused the deuterium containers to burst, releasing the deuterium and melting nearby aluminum-clad uranium slugs; oxygen in the forced air draft used to control core temperature then could have caused rapid oxidation of the hot uranium.

•

### General Electric's developmental boiling-water reactor—the

“first” private atomic power plant—was put into operation last week. Owned jointly by GE and Pacific Gas & Electric Co. (San Francisco), the DBWR is producing 5,000 kw. of electric power for distribution by PG&E.

Most significant fact about the reactor startup was that anticipated operating difficulties didn't occur. Samuel Untermyer, general manager of reactor operations at GE's Vallecito, Calif., atomic laboratory, reports that “expected power stability troubles didn't materialize, operation was smooth as silk.” The first order of business, says Untermyer, is to find out why.

One important development suggested by the smooth startup is the possibility of increasing the electrical capacity of the boiling-water reactor system. Though it's now licensed to operate at only 5,000 kw., chances are that GE will seek permission to boost the output—possibly to as much as 15,000 kw.

•

### Du Pont's Engineering Dept. begins building a Delrin acetal

resin plant this week at its Washington Works near Parkersburg, W. Va. (where several other plastics are made). The plant will employ 120. Production is scheduled to be under way by mid-1959.

The polymer is now being made in small amounts in a pilot plant at Du Pont's Belle, W. Va., works. Made from formaldehyde (*CW*, Dec. 8, '56, p. 68), Delrin is slated to sell for less than \$1/lb. when introduced commercially.

•

### A new semicommercial plant will help Shell Chemical ease the

problems of bringing new chemicals from the laboratory stage into commercial production. The facility, at Martinez, Calif., consists of several reactor systems with numerous purification units. It will be able to duplicate most known processes, will produce a wide variety of chemical products for Shell's market development program.



## Technology Newsletter

(Continued)

**The U. S. armed forces could use a flexible hydraulic coupling** that withstands -90 to 700 F temperatures and pressures up to 3,500 psi. That's one of 380 technical problems that need solving, according to the National Inventors Council. A free booklet is available from NIC, Commerce Dept., Washington 25, D. C. Others: crash-resistant fuel tanks; chemical de-icers for aircraft windshields; nonmetallic materials, with low radar reflectivity, that are better than resin-bonded fiberglass; a high-temperature seal to withstand 25,000-50,000-psi. pressures; a plastic-aluminum cement; metal-to-metal adhesives; improved electrolytes; chemicals for melting snow and ice; materials to stabilize soil; heat-resistant paints.

**A possible way by which viruses may cause cancer in humans** has been suggested by Nobel laureate Wendell Stanley, director of the University of California (Berkeley) virus laboratory. Viruses are known to cause some cancers in animals, haven't been proved to do so in man. Stanley feels that the reason may lie in a mechanism called transduction. In transduction, a fragment of genetic material—possibly part of a chromosome—hitches a ride on a virus as it invades a cell. The fragment may have the ability to change the character of the cell, cause the latter to produce disease-fighting agents or even to proliferate as cancerous cells. Presumably, the phenomenon occurs in a random, unpredictable manner, if it does indeed cause cancer.

**Ways to speed wine aging will be studied** under a \$10,000 industry grant to the University of California's department of viticulture and enology (Davis). As wineries switch to larger tanks for economic reasons, they encounter problems in maturing their wines. Reason: the new containers cut down on the exchange between wine and the surrounding air—the important factor in wine aging. Researchers will, therefore, look into the effects of oxygen on wine while varying temperature, time and pressure.

**Something new in atmospheric nitrogen fixation** has been discovered by two Rensselaer Polytechnic Institute (Troy, N. Y.) chemists, Paul Harteck and Seymour Dondes. In early experiments, they fixed nitrogen by exposing finely dispersed uranium-235 oxide powder to heated and compressed air. Now, they have incorporated the oxide into glass fibers—which make a greater amount of energy available for the production of nitrogen dioxide.

Harteck and Dondes are working under contract with the U. S. Atomic Energy Commission, had cooperation from Owens-Corning Fiberglass Corp. in developing the fiber. The glass fibers containing plutonium or thorium can also be manufactured. They are expected to prove useful in the design of future nuclear reactors, since they are easily fabricated and readily processed for the recovery of unconsumed uranium.





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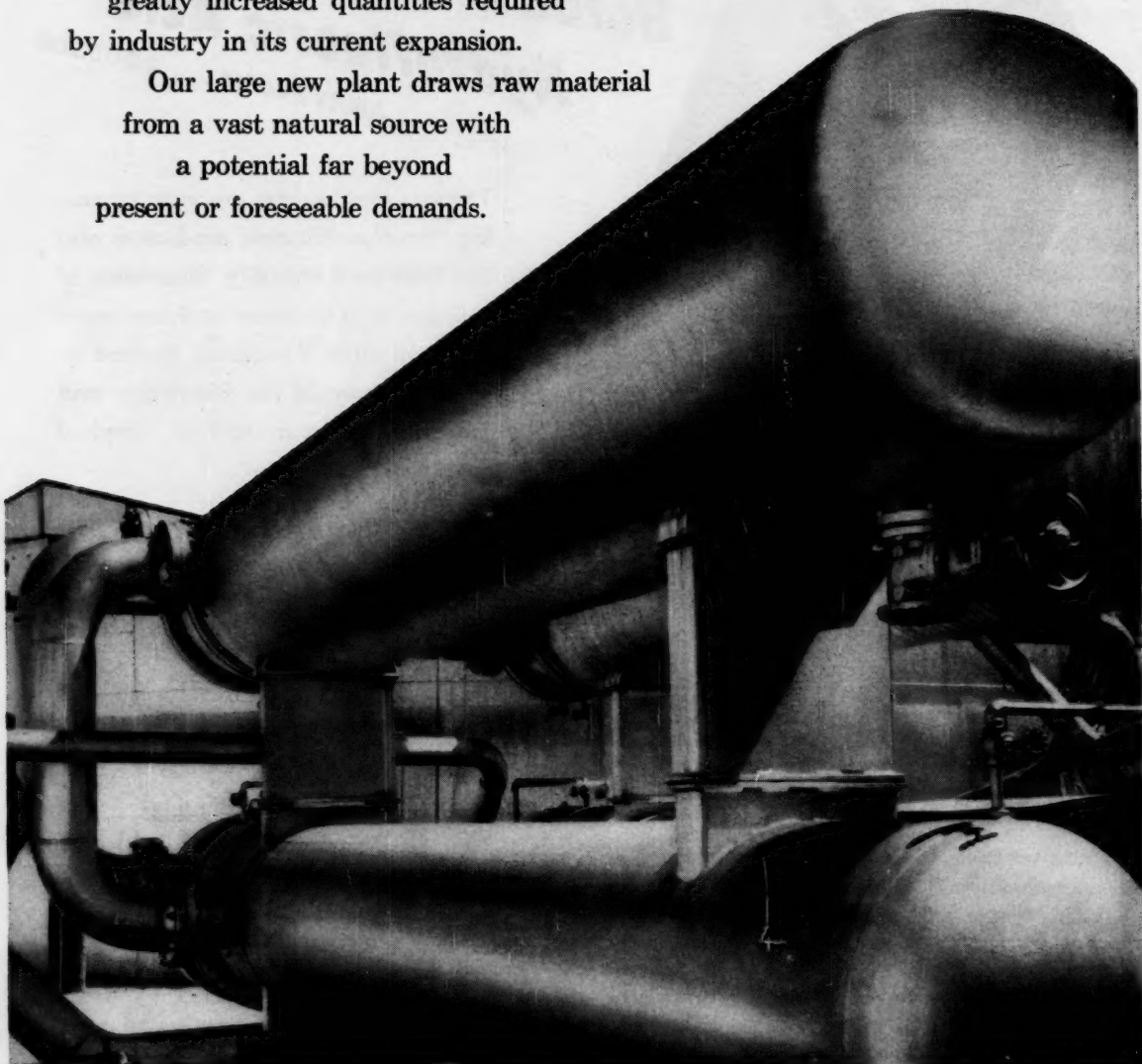




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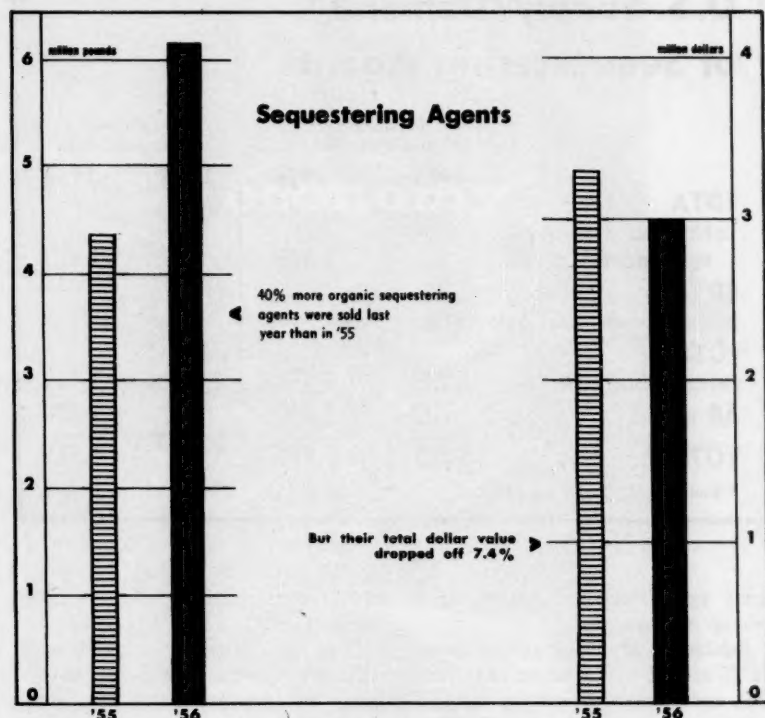
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## Squeeze on Sequestrants?

Is there a glut of organic sequestering agents\* in the U.S.? Latest U.S. Tariff Commission figures indicate strongly that there is a definite market imbalance. Production of these materials in '56, for instance, soared 85% higher than in '55, but sales increased only 40%. And, significantly, the value declined 7.4%.

Most sequesterant producers view the government data with unconcealed skepticism. But critics are hard put to give a convincing explanation of why the Tariff data is "in serious error."

But oversupply or not, U.S. sequesterant capacity continues to climb. American Cyanamid and Refined Products recently joined Dow, Geigy, General Aniline, Glyco and Nopco in the manufacture of sequestrants.

And Geigy has just begun construction of a new \$1-million plant at McIntosh, Ala. It's due onstream next spring. What specific products will be

made in the new plant hasn't been revealed, but chances are the output will consist largely of EDTA and various derivatives that have been under development by the firm.

**Output Soars:** The rise in total sequestrants output from 5.3 million lbs. in '55 to more than 9.8 million lbs. in '56 (chart, p. 66) is the sum of these individual increases cited by the Tariff Commission: EDTA, 85%; EDTA tetrasodium salt, 92%; and "all others," 235%. The commission reports no production data for EDTA monosodium iron salt for '56 (it was 666,000 lbs. in '55).

Sales of material in each category also increased significantly last year, compared with '55 sales: EDTA, 91%; monosodium iron salt, 38%; tetrasodium salt, 9%; and "all others," 134%. Total sales of these organic sequestrants in '56 amounted to almost 6.2 million lbs., vs. 4.4 million lbs. in '55.

**Earnings Plummet:** Despite last year's heartening 1.8 million lbs. of

additional sales, total dollar value dropped \$346,000, about 7.4%. Reason: in '55, average sale price for all sequestrants was about 75¢/lb., which brought value of total sales to a little more than \$3.3 million. In '56, the average price was slashed to 48¢/lb., bringing total sales value to just under \$3 million.

A look at the longer-range growth pattern of sequestrants reveals significant—though not parallel—increases in output and dollar values. Production of organic sequestering agents stepped up from an estimated 3 million lbs. in '52 to this year's anticipated 10 million. Value of material produced more than doubled (from \$2 million to \$4.5 million). Thus, over the five-year period, production increased some 233% while the dollar value lagged, registering a smaller 125% increase.

How has the volume of sequesterant sales in past years reflected the prices demanded by producers? The price of EDTA tetrasodium salt (the only sequesterant then reported by the Tariff Commission) in '53 and '54 was 62¢/lb. Sales for the two years were virtually identical—roughly 3.4 million lbs./year.

When, in '55, tetrasodium salt prices shot up to 76¢/lb. (representing a 22.6% increase), sales of the material fell off 16.6%. The price increase, however, was not the sole factor affecting sales—competition from other related sequestrants, appeared about then, doubtless helped depress sales of the tetrasodium salt.

When the brief flurry of higher prices petered out again in '56, ending at a low of 46¢/lb., total sales of organic sequestrants shot up more than 40%. All categories contributed to the over-all increase.

This year, the situation may improve considerably. Industry observers estimate that production will hit about 11.3 million lbs. and sales 10 million lbs. Total dollar value of material sold is expected to rise considerably over that of '56. And producers this year are drawing a bonus from lower raw-material costs (e.g., ethylene diamine prices were cut 4¢/lb. last January, dropped to 40¢/lb.).

**Stock Pile-up?** Another factor—and one that some observers think will work against the producers of sequest-

\*Mostly EDTA (ethylenediamine tetra-acetic acid) and its derivatives.



# CHEMICAL MARKETERS TO AMERICAN INDUSTRY



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## MARKETS

### U.S. Supply / Demand of Sequestering Agents\*

	Production (thousand pounds)		Sales (thousand dollars)	
	1955	1956	1955	1956
EDTA (ethylene diamine tetra-acetic acid)	983	1,823	765	1,467
EDTA monosodium iron salt	666	—	256	355
EDTA tetrasodium salt	2,889	5,553	2,855	3,127
All others	727	2,439	526	1,230
<b>TOTALS</b>	<b>5,265</b>	<b>9,815</b>	<b>4,402</b>	<b>6,179</b>

\* Source: U.S. Tariff Commission.

ering agents—is the apparent huge pile-up of stocks.

Production of all sequestering agents in '55 and '56 totaled about 15 million lbs., and combined sales for the two years came to a little over 10.5 million lbs. This indicates a surplus of close to 4.5 million lbs. of all organic sequestering agents.

Some production and sales forecasts for '57 suggest that sequestrants may be heading for still bigger stocks next year. One estimate: an excess of as much as 5.8 million lbs.

All types of sequestering agents appear to be generally in oversupply. For example, the combined '55-'56 tetrasodium salt output was more than 8.4 million lbs.; sales for the same period totaled just under 6 million lbs., indicating a spread of some 2.5 million lbs.

**Where Does It Go?** Attempts to work up an accurate end-use pattern for sequestering agents can be frustrating. The sequestrant business provides another example of confusion that stems from inadequate exchange of general information among producers. As might be expected, top industry experts hold widely differing opinions about the uses of sequestrants. The soap and detergents industry, for example, is generally believed to be taking some 29% of all organic sequestering agents consumed in the U.S. Estimates for other outlets: textiles, 24%; agriculture, 19%; rubber,

10%; electroplating, 7%; miscellaneous, 11%.

But some observers are convinced that this pattern is entirely out of line. Soap and detergents, they say, probably take only about 20% of the total consumed, and textiles use the lion's share—some 45%. Agricultural uses are considered greatly exaggerated, reportedly comprise only about 3% of the total market. The same is said of rubber and electroplating uses, whose respective needs are put at 5% and 2% of the total. This leaves 20% for miscellaneous uses.

Actual consumption of sequestering agents, however, is much more diverse than that breakdown might indicate. Many other outlets should be included—leather processing, treatment of oils and fats, laundry and dry cleaning, food processing, antibiotic production, and, in medicine, the treatment of metal and radiation poisoning.

Other applications: radiation decontamination, prevention of catalyst poisoning, ionic catalyst control, preparation of rare-earth elements.

Because uses for sequestrants are so diverse, accurate long-range market forecasting is almost impossible.

**Producers Object:** In denying the existence of the oversupply indicated by the Tariff Commission data, a few producers voice the wish that "we could make a lot more than we now can, just to keep up with orders."

Others admit that the appearance of



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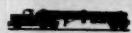
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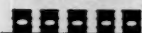
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## MARKETS

new producers has resulted in overcapacity and a limited oversupply—but certainly not a glut.

Perhaps the most common explanation of why Tariff data is "unrealistic" is that some firms make captive use of part of their outputs, and this demand, of course, is not included in the government's estimate of total sequesterant sales.

No one seems eager to reveal what these captive uses are, but there are carefully phrased hints that at least one "well-established" use—probably amounting to 300-400,000 lbs./year—is tied in with atomic energy activities. This would be classified information, and the use would not be reflected in Tariff figures. But Tariff Commission spokesmen unequivocally deny that such nonreportable uses have been eliminated from the published data.

One industry spokesman estimates '56 captive requirements for sequestrants at about 1 million lbs., and observes that an inventory of 1 million lbs. for last year was not out of line (but this, he hastens to add, does not necessarily represent the current situation).

The Tariff Commission's estimate of total dollar value of sequestrants sold also has been attacked by some outspoken critics. One says the average unit value of 48¢/lb. \* reported by the commission is far too low. He insists that truckloads of EDTA are now selling at 76¢/lb., and because the average price is closer to 80¢/lb., the total dollar value for '56 should be upped at least \$600,000.

If an oversupply of sequestering agents actually exists, producers would obviously not care to publicize the fact. If there is no oversupply and the Tariff Commission data is misleading, the reason may be simpler than most have suspected—laxity in reporting information. At least one producer admits candidly: "I don't believe we have reported sequesterant production and sales data to any government agency."

Right now, there's only one safe bet about the current sequesterant supply/demand muddle: whatever view is favored, it's easy to find experts who agree, and it's hard to argue with those who don't.

\*This average unit value (48¢/lb.) quoted by the Tariff Commission reflects a range of values extending from 42¢/lb. for the tetra-acetic acid to 83¢/lb. for the monosodium iron salt.

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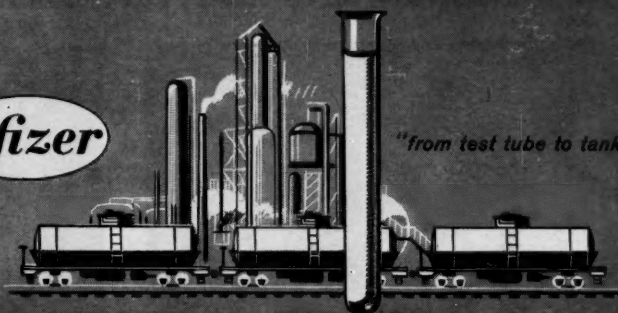
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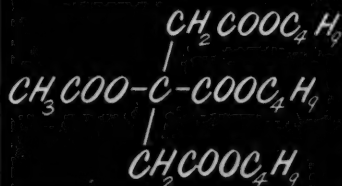
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One of the important features of this strong acid is its ability to solubilize iron oxide. Two outstanding jobs done by Pfizer Oxalates are found in the production of blueprints that have sharp white lines and, most recently, in the production of colored aluminum that has uniform, light-fast, color. Pfizer Oxalic Acid is available in granular and fine granular forms. Available oxalates include ammonium, ferric, sodium and potassium.

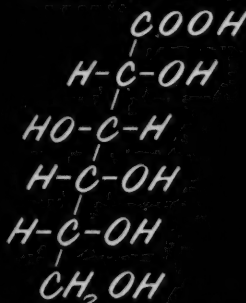
### TARTARIC ACID

High purity Pfizer Tartaric Acid offers both low toxicity and sequestering ability. Its salts find excellent use in metal plating processes.

### GLUCONIC ACID

Gluconic Acid has a low order of toxicity, is extremely mild and non-corrosive and has excellent sequestering properties. Pfizer produces gluconic acid by the fermentative oxidation of glucose and offers it in two forms: as a 50 percent aqueous solution; and as a stable salt.

#### GLUCONIC ACID



### ITACONIC ACID

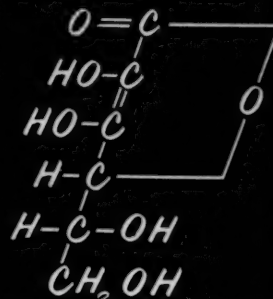
Pfizer skill in fermentation has made industrial itaconic acid a reality. Two carboxyl groups, a conjugated double bond and an active methylene group make itaconic acid a reactive and versatile molecule. Itaconic esters, readily prepared in

high yields, can be polymerized and may serve as useful plasticizers. Polyesters of itaconic acid and glycols may be polymerized or copolymerized to hard thermoset resins.

### ISOASCORBIC ACID

Isomerization has made ascorbic acid practical for industrial antioxidant uses. The isomeric form of ascorbic and its sodium salt offer the full antioxidant effectiveness of the U.S.P. products at much lower cost.

#### ISOASCORBIC ACID



You can order versatile PFIZER ORGANIC ACIDS in large tonnages. If you want further information on any of them, write us outlining the type of application you are considering. Pfizer Technical Service can help you with extensive data on organic acids.

Manufacturing Chemists  
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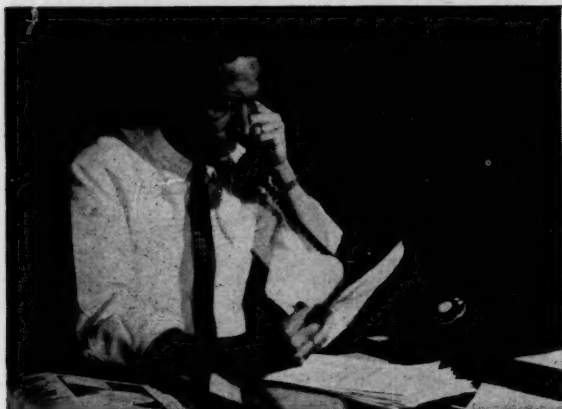


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Chemical Sales Division  
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San Francisco, Calif.; Vernon, Calif.;  
Atlanta, Ga.; Dallas, Texas



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MERCHANTS' MAN IN CINCINNATI calls the manufacturer, locates several drums of the chemical at the plant of a nearby soap company. They agree to lend three drums to meet the emergency. Merchants' truck makes the pickup.



AT MERCHANTS' WAREHOUSE, the drums are loaded into the car of "Dutch" Spotta, manager of Merchants' Cincinnati office. Regular delivery by truck will take too long.



A FAST 108 MILES LATER "Dutch" delivers the drums in time to keep production going. It was somebody else's product and somebody else's problem, but Merchants again lived up to its reputation for helping a customer out of a jam.

## WHY MERCHANTS' CINCINNATI MANAGER DROVE 108 MILES TO DELIVER SOMEBODY ELSE'S PRODUCT —

At Merchants, service goes beyond the mere filling of orders for industrial chemicals. Each office of Merchants' nationwide chain makes a point of becoming familiar with its customers' problems. In the past 35 years Merchants has frequently

"walked the extra mile" to help a production man out of a tight spot. Among the products offered are acids, alkalis, fungicides, surfactants, chlorinated solvents, emulsifiers, laundry compounds, soaps, dry ice and chemical specialties.



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STOCK POINTS: Albuquerque, N. M. • Erwin, Tenn. • S. Norwalk, Conn.



# Market Newsletter

CHEMICAL WEEK  
November 2, 1957

## **Chances of a sulfuric acid price cut are slimmer this week.**

In fact, there's a growing feeling in the trade that probably no reductions are likely to be soon forthcoming—despite the recent deep slash in crude sulfur prices (*CW Market Newsletter*, Sept. 28, Oct. 12).

Sulfuric producers ostensibly delayed posting any acid schedule change to "evaluate" what the various competing sulfur sellers would do. It's now becoming apparent that a more likely reason for the hold-off is this: sulfuric makers, having added up the pros and cons of cutting acid prices, have banged up against a rock-hard economic argument for not making the move. Mounting manufacturing costs (labor, transportation, etc.), which they've been absorbing over the past few years, more than cancel out the raw-material savings afforded by the currently lower sulfur prices.

Too, fewer consumers are clamoring for a cut. Most, by now, are apparently aware that acid producers had been contemplating hiking sulfuric prices (because of the higher production costs); thus, if present schedules remain unchanged, it could logically be regarded as a concession to customers on the part of producers.

**Where is most of the nation's sulfuric acid coming from?** Acid producing plants, of course, are spotted all over the U.S., but the South is becoming increasingly important as a sulfuric source. Merrill Lofton, the Commerce Dept.'s Atlanta field manager, after studying some Census Bureau statistics, comes up with word that Southern states shipped 63% more acid last year than in '47—higher by some 20% than the 43% average increase for the country as a whole during the same period.

Specifically, the South shipped to market more than 4.6 million tons of sulfuric, almost half the nation's entire supply of nearly 9.8 million tons.

**The animal feed industry will pay more for dicalcium phosphate** in 1958, thus joining other phosphate consumers in paying higher prices. (Tags on phosphates used in the fertilizer, food and detergent industries went up earlier this year.)

Major producer Shea Chemical is first to announce the increase—one that should ease, to some extent, the long-time profit pinch in dical production. And other makers are ready to follow suit. Shea Vice-President H. E. Frederick tells *CW* the company's 18½% feed-grade dicalcium phosphate, on Jan. 1, will be priced at these higher levels: bagged material, c.l., \$83.25/ton; bulk, \$80.25/ton, f.o.b. Columbia, Tenn.

Vital to the feed industry, of course, is the phosphorus content of the phosphate, and climbing costs of producing the element (mining rock, power costs, transportation, labor) is the prime price-raiser. The



## Market Newsletter

(Continued)

dical increases (from the current c.l. price of \$79.55/ton and bulk, \$76.55/ton) work out to a hike of 20¢/unit of phosphorus, brings the phosphorus unit price on 18½% material, to \$4.50.

**Russia is pushing hard** to cut into world fertilizer markets. A Tokyo-dated McGraw-Hill World News report to *CW* reveals that the Soviet Union has offered to sell Japan 50,000 tons/year of potassium fertilizer for the next five years. The kicker: the Russian price tag—\$27.50/ton, f.o.b. Baltic Sea—is “well under” the international level.

Kawakami Trading Co., recipient of the offer, is trying to get approval of the deal from the Japanese Agriculture and Forestry Ministry.

**The chemical self-sufficiency of Argentina is getting a boost** as a result of U. S. investment aid. The first Argentine plant to manufacture Freon has just begun operating, under Du Pont license; it'll be able to turn out some 4 million lbs./year. That's enough to cover Argentina's entire present consumption, and all foreseeable requirements of its expanding refrigeration and aerosol industries.

The new installation is part of the Ducilo manufacturing complex near Buenos Aires that's already producing rayon, nylon and cellophane. Freon raw materials, including carbon tetrachloride, will also be produced in Argentina.

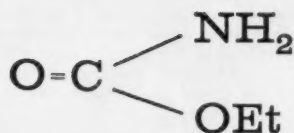
**More pigment prices are following the recent downtrend** in U. S. lead tags. (*CW Market Newsletter*, Oct. 26). National Lead tells *CW* that, effective this week, its basic carbonate white lead is down 1½¢/lb. to a c.l. level of 17½¢/lb., and basic silicate white lead (45X) is now 16¢/lb. (c.l.), a cent less than previous quotations. It's the first change on either since Jan. '56.

### SELECTED PRICE CHANGES—WEEK ENDING OCTOBER 28, 1957

	Change	New Price
<b>UP</b>		
Ammonium gluconate, tech., 200-lb. dms., lb. ....	\$0.02	\$0.45
Diphenylguanidine, bgs., dms., ton lots, frt. alld., lb. ....	0.02	0.54
Phosphate rock, Florida, land pebble, 66-68% b.p.l., bulk, c.l., mines, long ton .....	0.12	5.26
<b>DOWN</b>		
Vinylpyridine, 10-drum-tank, works, lb. ....	0.02	1.34
Basic carbonate white lead, bgs., c.l., ship. pt., frt. alld., lb....	0.015	0.175
Basic silicate white lead, (45X), bgs., c.l. ship. pt., lb. ....	0.01	0.16



Have you  
investigated the  
unusual properties of



# Urethane

(ethyl carbamate)

as a **S**olvent    for **S**ynthesis of **S**urfactants    in **P**lasticizers and **P**lastics    for production of fine organics and **P**harmaceuticals

Now available in bulk at substantially reduced cost

Classically known for many years but now available in commercial volume in both U.S.P. fused and crystalline grades, Urethane has many unique properties which offer interesting opportunities for investigation.

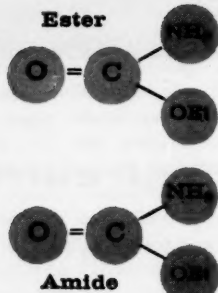
Urethane finds wide application as an intermediate for the synthesis of pharmaceuticals and fine organics.

It exhibits excellent solvent properties and is of interest as a specialty solvent and co-solvent.

As a reactive intermediate, Urethane combines an ester and an amide linkage in one molecule suggesting such applications as . . .

- modification of urea-formaldehyde and melamine-formaldehyde resins . . .
- synthesis of surface-active materials . . .
- an intermediate in the production of polymers, plasticizers, pesticides, etc.

For further information on reactions and suggested uses, write for your copy of Technical Data Sheet No. 5: Urethane.



## AN INVITATION

FMC Organic Chemicals Division now offers in developmental quantities other alkyl and aryl carbamates. Currently available are methyl, isopropyl, butyl, octyl, dodecyl, phenyl, allyl and methallyl carbamates. Technical Data Sheet No. 8: Alkyl & Aryl Carbamates will be sent on request.

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## FMC Organic Chemicals Division

Food Machinery and Chemical Corporation  
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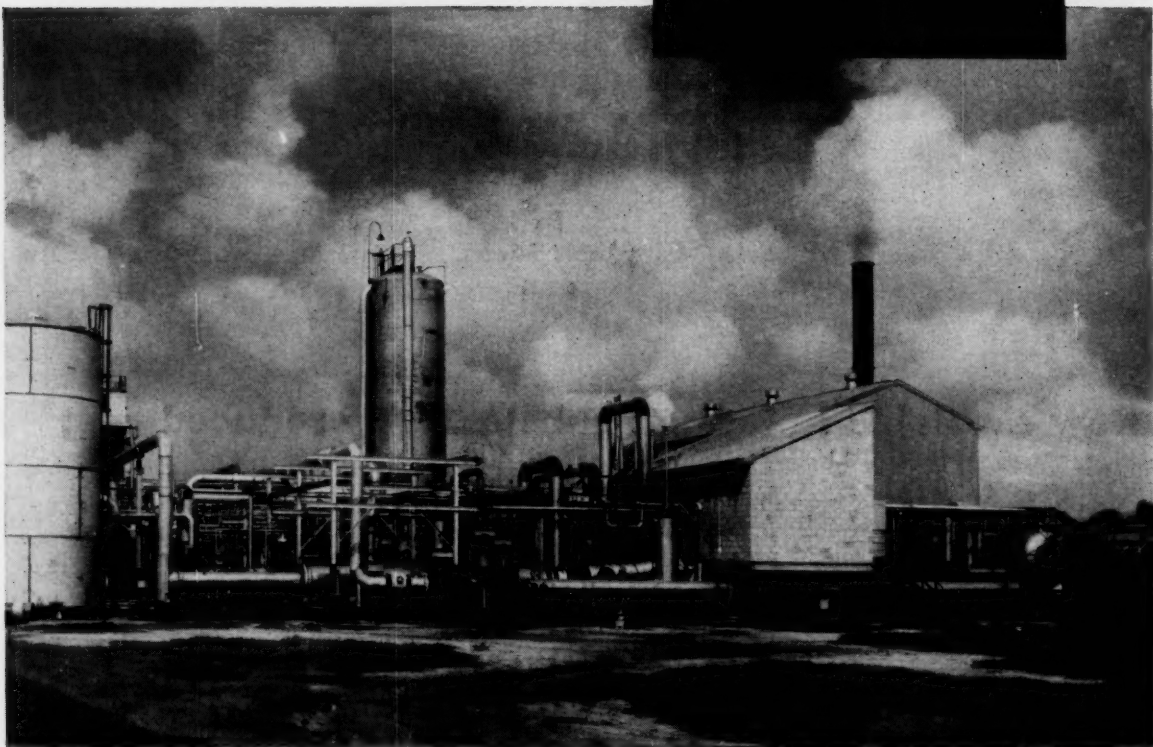
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• Girdler nitric acid plants employ the well-known Du Pont process, using high-pressure catalytic oxidation, to produce nitric acid. These plants offer greater economy, in both investment and operating costs, than atmospheric or low-pressure units. With the high-pressure process, 55%-60% nitric acid is produced with efficient use of catalysts, and with lower utility requirements.

## NITRIC ACID



### New Girdler nitric acid plant goes "on stream"

The new 250 ton per day nitric acid plant of Southern Nitrogen Company, Savannah, Georgia, shown above, was engineered and built by Girdler. This is one section of a Girdler plant designed to produce ammonia and convert it into nitrogen products.

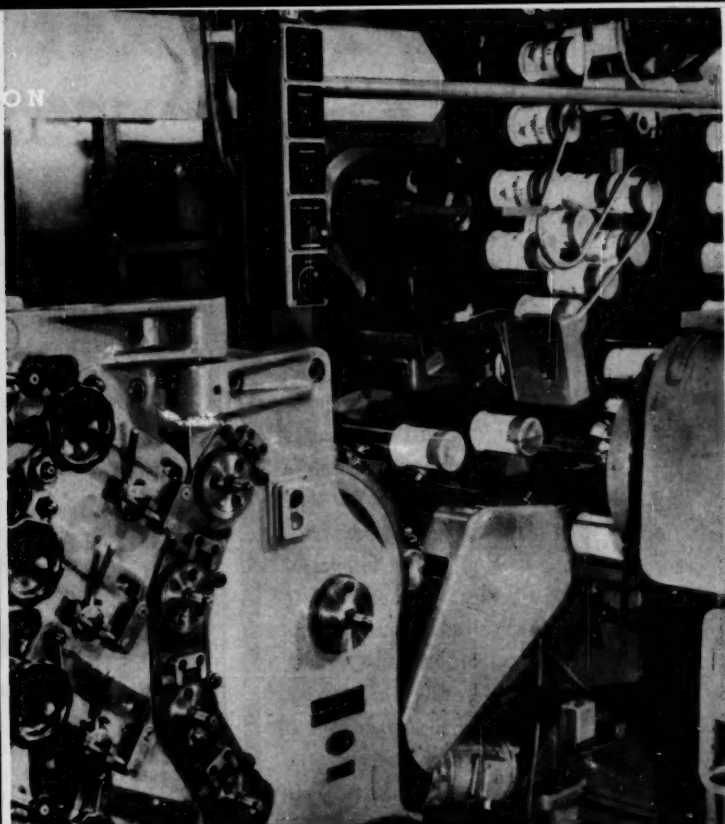
Girdler nitric acid plants employ the Du Pont process. Hence, when you come to Girdler for your nitric acid facilities, you get the combined know-how of Du Pont and Girdler . . . to assure minimum capital investment and operating costs. For complete information, call the nearest Girdler office today.

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GAS PROCESSES DIVISION . . . Offices: New York, San Francisco





Food and oil industries are prime targets as can manufacturers gear for mass output.

## Aluminum Cans Point for Volume Markets

With aluminum sales slumping and surplus stocks mounting—to an expected 1 billion lbs. in '58—efforts by major aluminum producers to crack the can market are rushing ahead this week at unabated pace.

• Kaiser Aluminum on Thursday dedicated a new, 23,600-sq.-ft. plant near Chicago, revealed a new production process that should go a long way toward making aluminum cans more competitive with tin plate. Utilizing a special "deep draw" method that makes seamless cans by pressing a flat disc into a die, Kaiser will supply Kraft Foods with some 5.5 million cans for cheese packaging. Air Reduction Sales will use aluminum cans, too—for stainless steel electrodes. "Deep draw" fabrication, claims Kaiser, is faster than impact extrusion or conventional drawing. How much faster, Kaiser won't say. But the firm does claim that seamless cans will compete, pricewise, with tin plate, where a thin gauge (about 0.005 in.) is feasible or where other properties of the metal (lightness, corrosion resistance, appearance, etc.) enter the calculations.

• Following up its much-publicized deal to supply Esso with aluminum oil cans, Reynolds Metals is setting up a seven-man field engineering team to develop aluminum packaging markets and generally promote the use of aluminum in the chemical and petroleum industries.

• Continental Can Co. is making three-piece and drawn-aluminum cans available immediately, will add impact-extrusion types early next year.

• American Can Co. is readying a new aluminum division in its research and technical department. The company's aim: "to find practical low-cost methods of manufacturing aluminum alloy into commercial containers."

• Victor Metal Products will build a 32,000-sq.-ft., extrusion-process aluminum can plant that will push out 120 million aerosol containers yearly.

**Big Hitches:** But against this backdrop of optimism, and while Reynolds describes its Esso deal as "a major breakthrough" in the long battle for a place in the \$1.6-billion/year can market, a few primary aluminum

makers are skeptical. And of the major oil companies, only Esso has shown more than a detached interest in aluminum containers.

Details of the Reynolds-Esso deal point up the obstacles standing between aluminum producers and the vast can market. Regular price for tin quart-size oil cans is \$45/thousand, while aluminum cans of the same type are tagged at \$67/thousand. To sell the cans to Esso at the tin-can price, Reynolds will have to buy and salvage the used cans. Can-crushing machines, a collection system, and incentive premiums to service station dealers will be provided at every Esso station.

No scrap-recovery arrangements appear in the Kaiser-Kraft deal. Kaiser, in fact, wants no part of scrap operations; it wants to sell aluminum, not buy it. And toward that end, it will make know-how on its "deep draw" process available to can manufacturers. The new plant is more a pilot venture than an effort to become a canmaker.

Some industry spokesmen, however, express doubts that a reclaiming system would work with shelf goods,




**Wanted!**

An engineer with artistic ability or an artist with leanings toward engineering. Must be able to help meet the challenges of biweekly publication as Associate Art Director of Chemical Engineering. If you've had magazine experience and want to help, write to

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Chemical Engineering  
330 West 42nd Street  
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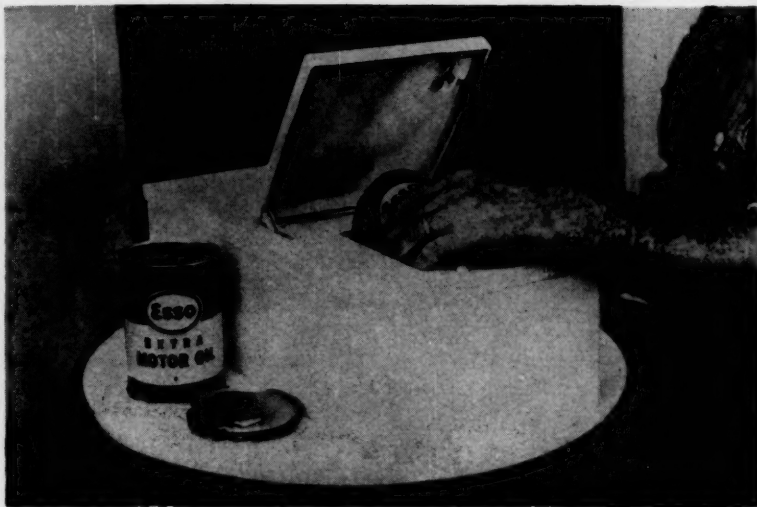
**"NOSEY"**  
says:



MAYBE this'll interest you folks who use printed matter, or publish magazines, or who make printing inks. Years ago — 1949 to be exact—FRITZSCHE ran some advertising inserts printed with odorized inks, to test some of their printing ink perfumes and odorants. Do you know, today, after eight years, those printed pieces still have a real nice fragrance! And if you don't believe me, just write FRITZSCHE to send you one of those prints. I know they'll do this gladly — so long as their supply lasts. It just goes to show how effective a good ink deodorant can really be!

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**SALES**



**Can crusher and salvage are keys to Reynolds-Esso deal.**

are convinced aluminum will never compete with steel cans unless the former's price drops. Reynolds admits the oil-can arrangement is an experiment, feels that mass production of aluminum cans will permit prices competitive with tin plate on a no-reclaiming basis.

And Canco President William C. Stolk points out that although "Canco's costs for tin plate . . . have increased more than 91% in the last 10 years, the gap between the cost of the two metals has been narrowing constantly." Other aluminum optimists note the advantage of a reliable domestic source of supply for can metal—tin, of course, is imported.

**Slow Stepper:** A stumbling block in aluminum's road to the can market is its slow fabrication speed—50-60 cans/minute, compared with 600/-minute for tin cans.

Big drawback to speeding up aluminum can production has been the lack of a rapid seam-soldering method. Two current fabrication methods—drawing and impact extrusion—eliminate the seam, but are rather slow for high-speed production. Kaiser's process may overcome this difficulty.

Moreover, impact extrusion has an enthusiastic rooting section in the can industry. The completely automatic process can be linked in a continuous line from molten aluminum to packaged and labeled product.

Aluminiumwerke Goettingen, sub-

sidary of Aluminium, Ltd., recently opened the world's first automatic can factory in Germany, starting the line at the extrusion stage. While aluminum cans for foods and motor oils have largely replaced tin-plate cans in much of Europe, Aluminium, Ltd., doesn't expect that to happen in the U.S. at present metal prices.

But Victor Metal Products thinks otherwise. While wholesale invasion of the tin-can market by aluminum seems unlikely, many industry people foresee wider use of aluminum for products in which tin is unsatisfactory—e.g., cans for fish, citrus fruits, beer. Even such limited acceptance could open vast markets. In '56, steel consumption, in short tons, for cans included: fish and seafood, 110,188; fruit and vegetable, 1,484,311; beer, 724,166; oil, 290,887.

Conversion of only 10% of the existing can market, Kaiser market researchers believe, would consume 200,000 tons/year of aluminum. That's 10% of the aluminum industry's present capacity, is another reason for the spate of market development projects.

To win these markets, aluminum must buck a galaxy of new steel-coating materials including oleoresins, phenolics, vinyls, epoxy resins. Can-makers are also developing an aluminum-plating process for steel that could—if it proves economical—stand in the way of acceptance of all-aluminum cans.

**A Broad Field:** If its place on the



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with wide variety of evaporation ranges

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... for applications where very fast evaporation and high solvency are required.

## **SHELL XYLENE**

... has an exceptionally narrow distillation range, is slower drying than toluene.

## **SHELL CYCLO-SOL 53**

... an excellent solvent with higher flash point and slower evaporation than xylene. Recommended for bake finishes and flow coating.

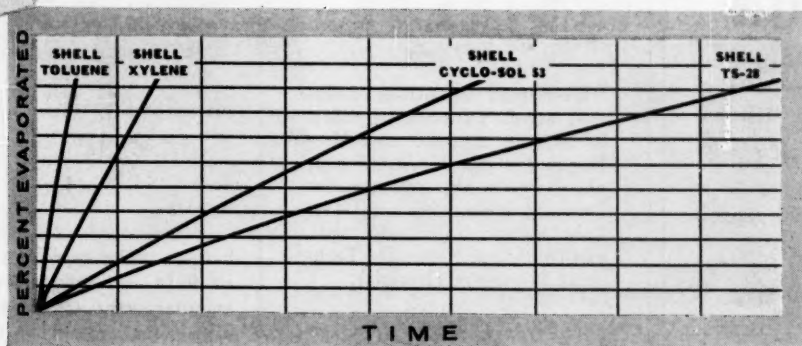
## **SHELL TS-28 SOLVENT**

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- One application of Sulframin E's fast wetting properties is its use to lay down coal dust to prevent explosions.
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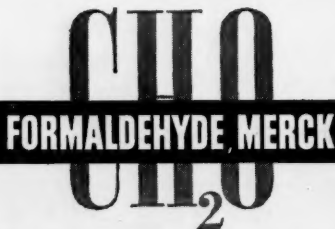
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CHEMICAL DIVISION  
RAHWAY, NEW JERSEY

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## SALES

nation's can shelf is uncertain, aluminum has been making healthy strides in other forms of packaging.

• Foil. Between the years 1952 and '55, aluminum foil production doubled to 203.1 million lbs. Three-fourths of this went into packaging.

• Collapsible tubes. Aluminum has taken the lead in this fast-growing (up 66% in 10 years), \$40-million/year market—more than 50% of collapsible tubes are made of aluminum. Toothpaste fills more than 53% of the tubes; medicinals and pharmaceuticals, about a fifth (*CW*, Oct. 19, p. 114).

• Drums and kegs. Aluminum has been making slow but steady headway in this market. Latest available figures (for 1954) show steel barrel and drum sales at \$143.8 million, aluminum at \$1.3 million.

While aluminum drums cost about five times more than steel, they are not as expensive as stainless, are



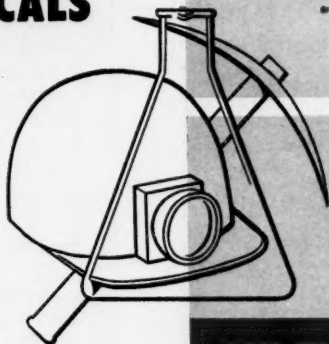
## Handy Hand Labeler

**Making its bow this week:** a new portable can labeler that's hand-operated, can handle up to 500 5-gal. cans/hour. Rubber printing plates or handset rubber type print over an area of 9x14 in. Main sales pitch, says manufacturer Chapman Chemical, are savings realizable when the printer is used for different products packaged under the same brandname. Cans may be ordered lithographed with brandname on one side; the printer adds specific product identity, other descriptions.





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37% Copper as metallic. Available in polyethylene-lined drums or bags.

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Minimum 76% Copper as metallic. Technical grade . . . NOT A BY-PRODUCT.

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36% Zinc as metallic. White, free flowing powder.

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Secondary Zinc Oxide.

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65% Mn SO<sub>4</sub>. Designed specifically for inclusion in mixed fertilizer.

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# Benzol

## PRODUCTS COMPANY

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Manufacturers of Fine Chemicals

### SALES

claimed to last 12-15 years. Added bonus: a 25% salvage value. The trend toward lightweight throwaway steel drums, plastic-lined for corrosives, has probably slowed acceptance of the returnable aluminum models.

Sales points for aluminum drums: no crackable lining; weight about a third that of steel drums. Hydrogen peroxide shipments for rocket fuel have given aluminum drums a boost. Other chemicals generally hauled in aluminum include fuming nitric acid, phenol, rosins, naphthenic acids, fatty acids. And aluminum beer kegs have been making steady sales progress in the last few years.

• **Bottles.** Relatively few aluminum "bottles," ranging in size from a fraction of an ounce to several gallons, are used for shipping corrosives, essential oils, other fine chemicals. Despite high cost of the lightweight metal cans, shippers sometimes prefer them to glass containers because of shipping economies.

Another market for aluminum may exist in compressed-gas cylinders. Only a few weeks ago, the Interstate Commerce Commission authorized the use of welded aluminum cylinders for liquefied petroleum gas. Tank truckers however, report that the cylinder cost is now "forbidding."

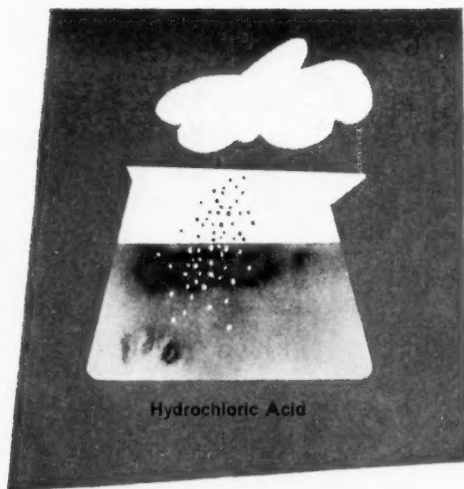
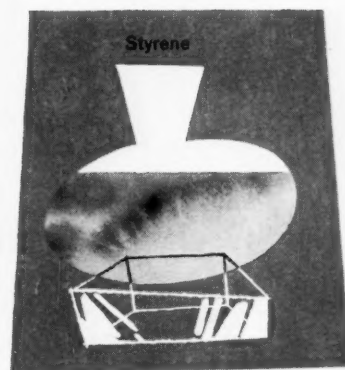
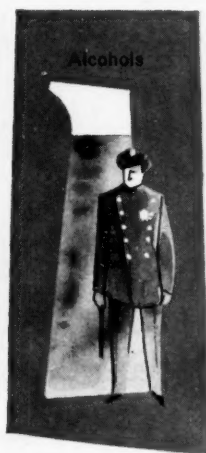
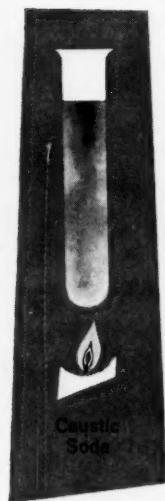
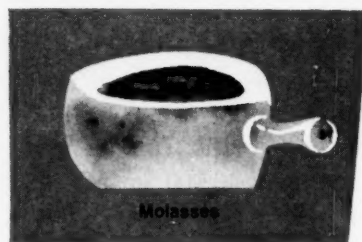
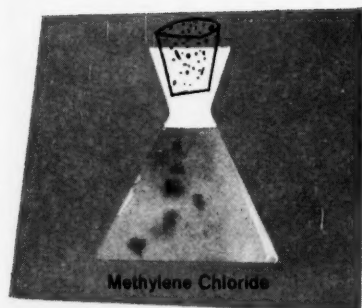
**A Place in the Sun:** Whether aluminum will reach "big time" status in the can market, as it has in other packaging fields, is moot. But odds are good that the metal's unique qualities should also help nudge it along to what Kaiser describes as a "broad new market . . . challenging in size the building industry—the present leader."

### DATA DIGEST

• **Emulsion chemicals:** Reichhold Chemicals (White Plains, N.Y.) offers three new bulletins. No. SC-24 presents a thorough discussion of formulation principles for emulsion paints using homopolymers and copolymers; No. SC-25 gives physical properties, specifications and formulation instructions for two new alkali-soluble resins for floor waxes; Bulletin SC-26 describes 1504 Synthemul, a fine-particle alkyd emulsion designed for industrial surface-coating applications. Film properties, drier recommendations, formulations and test results are given.



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Chemical Week BUYERS' GUIDE

Published September 20, 1958

Closing ROB June 15 . . . Catalog Inserts August 1

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# SPECIALTIES



Another water-based flat paint is now available to painters and do-it-yourselfers as . . .

## Cyanamid Stirs up Emulsion Paint Business

Paintmakers attending this week's meeting of the Federation of Paint and Varnish Production Clubs in Philadelphia got their first look at a new kind of water-emulsion paint vehicle. It's a water emulsion of an alkyd resin, an American Cyanamid product trademarked Cyaqua 405-20.

If the product lives up to its billing, makers of competitive vehicles—i.e., polyvinyl acetate, vinyl acetate copolymer, acrylics and styrene-butadiene—will have new competition.

Paints containing the new vehicle, says Cyanamid, have these advantages over those made with previously available resin emulsions: better stability in cans, better freeze-thaw characteristics, and quicker recoating time (second coats can be put on a half-hour after the first). The alkyd emulsion contains no external plasticizer, no conventional-type emulsifiers and tolerates high pigment loading (coherent films with up to 80% pigment volume concentration can be obtained).

Cyanamid lists these characteristics of the new alkyd resin emulsion: total solids, 46-48%; pH, 8-9; pounds/gal., approximately 8.8; pounds/gal. of solids 9.4; average particle size, less than 1 micron; odor, negligible.

So far, the company has made claims only for the product's performance on interior walls. Tests are now under way to determine how the material will perform when it's applied to metal surfaces.

To make a 100-gal. batch of interior flat white, Cyanamid suggests that the paintmaker use 30.15 gal. of alkyd emulsion, 7.63 gal. of titanium dioxide and 27.71 gal. of water (among other ingredients).

This formula, says the firm, gives the paintmaker a cheaper in-can cost than that of many paints now on the market—a contention questioned by some paintmakers who were contacted by *CW*.

Using 22¢/lb. as the cost of the emulsion, the doubters arrive at costs

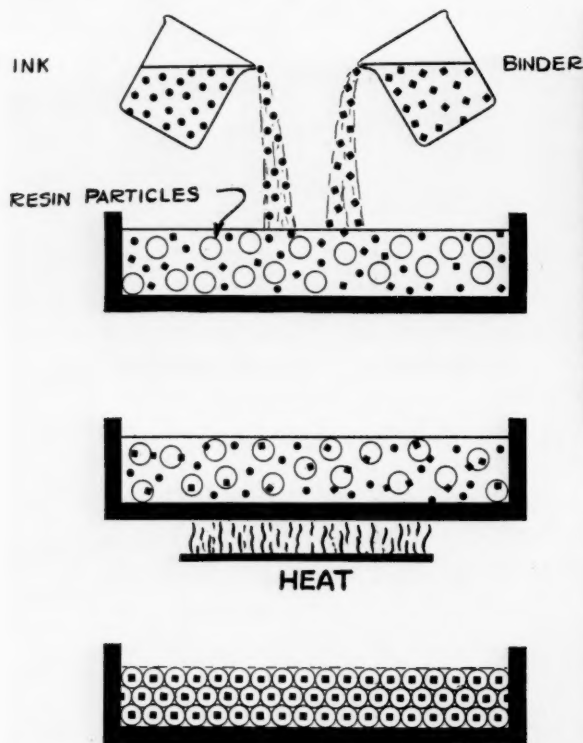
for the white paint suggested above that average 30¢/gal. higher than the cost of a polyvinyl acetate paint. Cyanamid, of course, prefers to discuss costs in the context of the alkyd's claimed performance advantages.

If these calculations are correct, Cyanamid may have a problem convincing paintmakers that the advantages of its new product outweigh the cost differential between it and polyvinyl acetate, for example.

And there's also this to be considered: because of a flood of new developments, paintmakers are just a short step ahead of the homemaker in trying to keep up with the accelerating parade of products. It's getting harder all the time to make the paintmaker drop work on a material he's just getting the feel of to turn his attention to a still-newer material.

He won't do it with relish, but may be forced to by competition and the pressure of the public's demands for improved products.





Sketch (left) shows how Porelon is made and photo (right) shows where it's used.

## Doll-Skin Synthetic Finds New Jobs

What started out as a search for more life-like skin for dolls ended this week in introduction of a new synthetic material that may be of major importance to specialty chemical makers. Called Porelon, it's the product of Perma Industries Inc. (Los Angeles).

Perma, which has just taken the wraps off the material, describes it as a synthetic in which liquid can be incorporated during manufacture, then given off at a predetermined rate. The material may also be made without liquid content, yielding a fabric combining waterproofing characteristics with porosity (permitting controlled passage of air).

As the drawings above indicate, the material is made by combining a binder, a liquid and a resin, heating the mixture until a porous mass is formed. Polyvinyl chloride and a variety of other resins—e.g., nylon, copolymers of polyvinyl chloride and vinylidene chloride may be used with whatever liquid is to be dispensed.

The liquid entrapped in the pores of the material may be ink, perfume,

medications, lubricants, coloring agents or insecticides. The rate at which the liquid, or vapor, is given off is controlled by regulating the size of the pores and/or the viscosity of the liquid. Liquid-holding capacity of the material can be quite high—up to 40% by weight. In addition, the material can be manufactured with a wide range of resiliencies—from soft and sponge-like to rigid.

The sponge-like material can be molded into any shape, is claimed to be easily colored with conventional dyes.

The process utilizes resin spheres approximately 6 microns in diameter; after heating, pores of about 2 or 3 microns exist between spheres. Capillary attraction keeps the liquid in the solid mass, also helps keep it dispersed.

One product using Porelon is already available. It's a nonrubber printing stamp in which ink is entrapped in polyvinyl chloride. Perma says the stamp will give 50,000 clear impressions using a strip of Porelon only 3/16 in. thick.

Perma will not make or sell products utilizing its discovery. It intends to license the material on an industry-by-industry basis. The company has patents on some products, others have been applied for.

Some applications the company envisions for the material: lipsticks (with application tips that won't lose their shape); self-lubricating machinery bearings; room deodorants; nonadhering, self-medicating bandages; vapor-type antirust agents; antispermacide contraceptive devices; depilatories; combs (impregnated with hair tints, waving solutions, neutralizers or hair dressings); batteries (wet cell); self-medicating corn plasters; and suppositories. Uses suggested for the liquidless plastic include sheeting for diapers, watch bands, raincoats, shipping containers for vegetables.

Perma is now closing a million-dollar licensing deal with a rubber-stamp maker. Later, it will concentrate on licensing the material to makers of such items as cosmetics, lipsticks and bandages.



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# CHEMICAL WEEK • ADVERTISERS INDEX

November 2, 1957

<b>ALLIED CHEMICAL &amp; DYE CORP., NITROGEN DIV.</b> ..... 16 Agency—G. M. Basford	<b>GENERAL AMERICAN TRANSPORTATION CORP. TERMINAL DIV.</b> ..... 81 Agency—Edward H. Weiss & Co.	<b>TRUBEK LABORATORIES, INC.</b> ..... 13 Agency—Ray Ellis Adv.
<b>AMERICAN CYANAMID CO.</b> ..... 6-7, 57 Agency—Hazard Adv. Co.	<b>GIRDLER CO., THE</b> ..... 74 Agency—The Griswold Ebleman Co.	<b>ULTRA CHEMICAL WORKS</b> ..... 78 Agency—Hazard Adv. Co.
<b>AMERICAN MESSER CORP.</b> ..... 3rd Cover Agency—Seberhagen Inc.	<b>GULF OIL CORP.</b> ..... 55 Agency—Ketchum, MacLeod & Grove, Inc.	<b>UNION CARBIDE CHEMICALS CO. DIV. OF UNION CARBIDE CORP.</b> ..... 4th Cover, 15 Agency—J. M. Mathes Inc.
<b>AMERICAN MINERAL SPIRITS CO.</b> ..... 25 Agency—Leo Burnett Co., Inc.	<b>HARSHAW CHEMICAL CO.</b> ..... 63	<b>U. S. RUBBER CO.</b> ..... 11, 60 Agency—Fletcher D. Richards Inc.
<b>AMERICAN POTASH &amp; CHEMICAL CORP.</b> 32 Agency—McCarty Co.	<b>HERCULES POWDER CO.</b> ..... 26 Agency—Fuller & Smith & Ross, Inc.	<b>VITRO CORP. OF AMERICA</b> ..... 58 Agency—Molesworth Assoc.
<b>AMOCO CHEMICAL CORP. DIV. OF STANDARD OIL OF INDIANA</b> ..... 2 Agency—D'Arcy Adv. Co.	<b>INTERNATIONAL SALT CO., INC.</b> ..... 49 Agency—Batten, Barton, Durstine & Osborn Inc.	<b>WAX &amp; ROSIN PRODUCTS CO.</b> ..... 68 Agency—Norman D. Waters Assoc.
<b>ANTARA CHEMICALS, DIV. OF GENERAL ANILINE &amp; FILM CORP.</b> ..... 14 Agency—The House of J. Hayden Twiss	<b>MERCHANTS CHEMICAL CO., INC.</b> ..... 70 Agency—G. M. Basford	<b>WEST END CHEMICAL CO.</b> ..... 64 Agency—Norton M. Jacobs Co.
<b>BARNEBEY-CHENEY CO.</b> ..... 78 Agency—Byer & Bowman Adv. Agency	<b>MERCK &amp; CO., INC.</b> ..... 78 Agency—Charles W. Hoyt, Inc.	<b>WYANDOTTE CHEMICAL CORP.</b> ..... 44-45 Agency—Brooke, Smith, French & Dorrance, Inc.
<b>BENZOL PRODUCTS CO.</b> ..... 80 Agency—The House of J. Hayden Twiss	<b>MONSANTO CHEMICAL CO.</b> ..... 43 Agency—Gardner Adv. Co.	
<b>BERKSHIRE CHEMICALS, INC.</b> ..... 66 Agency—Molesworth Assoc.	<b>MUTUAL CHEMICAL DIV., ALLIED CHEMICAL &amp; DYE CORP.</b> ..... 19 Agency—G. M. Basford	
<b>BROWN &amp; ROOT, INC.</b> ..... 67 Agency—D'Arcy Adv.	<b>NORFOLK &amp; WESTERN RAILWAY</b> ..... 10 Agency—Houck & Co., Inc.	
<b>CHEMICAL ENGINEERING</b> ..... 53	<b>OXY-CATALYST INC.</b> ..... 37 Agency—Gray & Rogers Inc.	
<b>CHEMICAL WEEK</b> ..... 82	<b>PENNSALT CHEMICALS CORP.</b> ..... 4-5 Agency—Aitkin-Kynett Adv., Inc.	
<b>CHICAGO BRIDGE &amp; IRON CO.</b> ..... 52 Agency—Russel T. Gray, Inc.	<b>PENNSYLVANIA REFINING CO.</b> ..... 46 Agency—Downing Industrial Adv., Inc.	
<b>DELHI TAYLOR LIL CORP.</b> ..... 39 Agency—Sam J. Gallay Adv.	<b>PETRO-CHEM DEVELOPMENT CO., INC.</b> 59 Agency—Sam J. Gallay Co., Adv.	
<b>DOWELL INC.</b> ..... 1 Agency—Rivers, Dyke & Co., Adv.	<b>PFIZER &amp; CO., INC., CHARLES</b> ..... 69 Agency—MacManus, John & Adams	
<b>DU PONT de NEMOURS INC., E. I. POLY-CHEMICALS DEPT.</b> ..... 8-9 Agency—Batten, Barton, Durstine & Osborn Inc.	<b>PITT-CONSOL CHEMICAL CO.</b> ..... 50 Agency—RAF Adv., Inc.	
<b>ENJAY CO.</b> ..... 41 Agency—McCann-Erickson, Inc.	<b>RELIABLE STEEL DRUM CO.</b> ..... 42 Agency—E. W. Moore Adv. Inc.	
<b>FISHER CHEMICAL CO., INC.</b> ..... 12 Agency—Frelwald & Coleman Co.	<b>SHELL OIL CO.</b> ..... 77 Agency—J. Walter Thompson Co.	
<b>FISHER SCIENTIFIC CO.</b> ..... 56 Agency—Smith, Taylor & Jenkins, Inc.	<b>SHIPPERS CAR LINE CORP.</b> ..... 47 Agency—Lewis Adv. Co.	
<b>FMC ORGANIC CHEMICALS DIV., FOOD MACHINERY &amp; CHEMICAL CORP.</b> ..... 73 Agency—The McCarty Co.	<b>SINCLAIR CHEMICALS, INC.</b> ..... 33 Agency—Morey, Humm & Warwick	
<b>FRITZSCHE BROS., INC.</b> ..... 76 Agency—Calson Adv. Corp.	<b>SOLVAY PROCESS DIV. ALLIED CHEMICAL &amp; DYE CORP.</b> ..... 2nd Cover Agency—Atherton & Currier, Inc.	
<b>FRONTIER CHEMICAL CO.</b> ..... 68 Agency—The McCormick-Armstrong Co.	<b>SOUTHERN STATES CONTAINERS DIV., REYNOLDS ALUMINUM SUPPLY CO.</b> 29 Agency—George & Glover Adv.	
<b>GAYLORD CONTAINER CORP., DIV. OF CROWN ZELLERBACH CORP.</b> ..... 48 Agency—Oakleigh B. French & Assoc., Inc.	<b>STEPAN CHEMICAL CO.</b> ..... 51 Agency—Frank C. Nasher, Inc.	
<b>GENERAL AMERICAN TRANSPORTATION CORP. WIGGINS DIV.</b> ..... 20 Agency—Edward H. Weiss & Co.	<b>STRAN-STEEL CORP. DIV. OF NATIONAL STEEL CORP.</b> ..... 40 Agency—Campbell-Ewald Co.	
	<b>TENNESSEE CORP.</b> ..... 79 Agency—Crowford & Porter, Inc.	

## tracets SECTION

(Classified Advertising)

F. J. Eberle, Business Mgr.

<b>CHEMICALS: Offered/Wanted</b> ..... 85	
<b>EMPLOYMENT</b> ..... 85	
<b>EQUIPMENT: Used/Surplus New</b> ..... 86	
<b>For Sale</b> ..... 86	
<b>WANTED</b> ..... 86	
<b>MANAGEMENT SERVICES</b> ..... 86	
<b>SPECIAL SERVICES</b> ..... 86	

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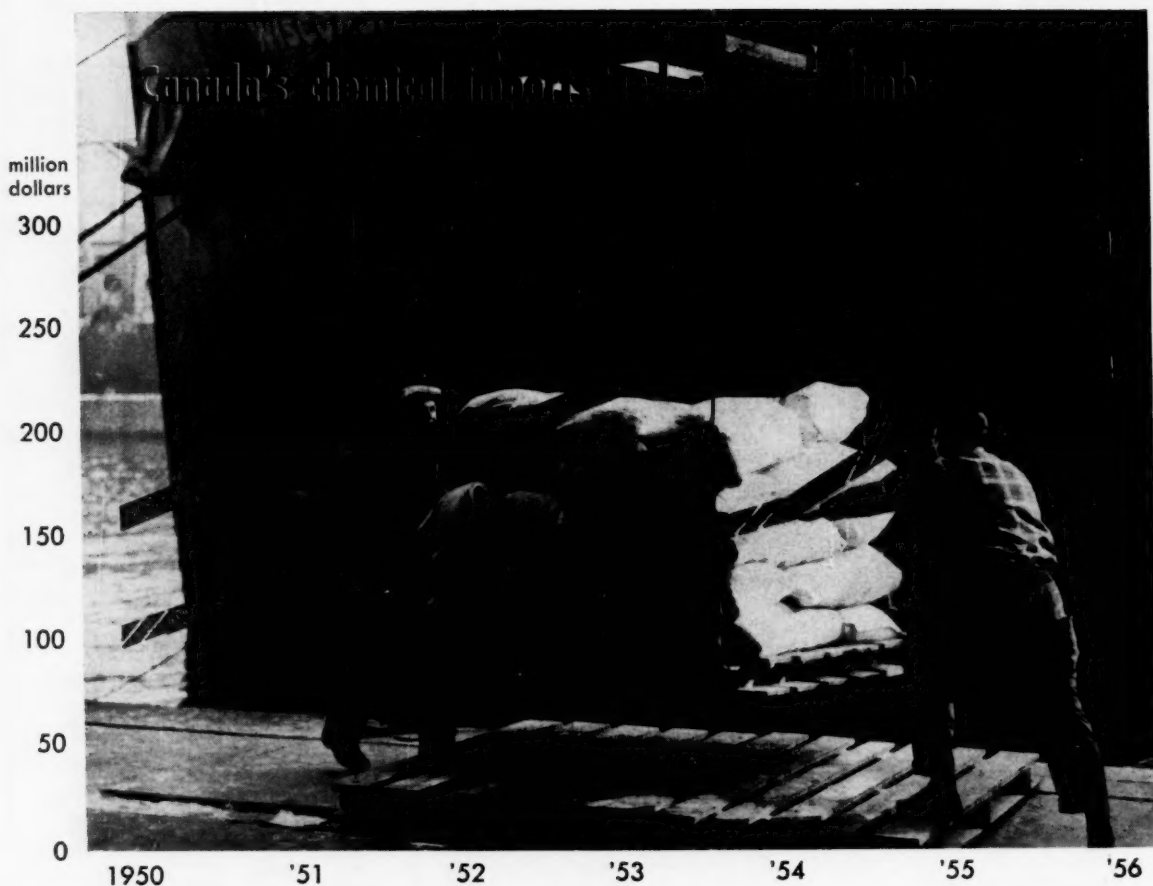
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## C H A R T I N G

## B U S I N E S S

November 2, 1957



## Dominion Growth Boosts North-South Trade

Shipments of chemicals to and from Canada continue at a brisk and profitable pace, last year set new records.

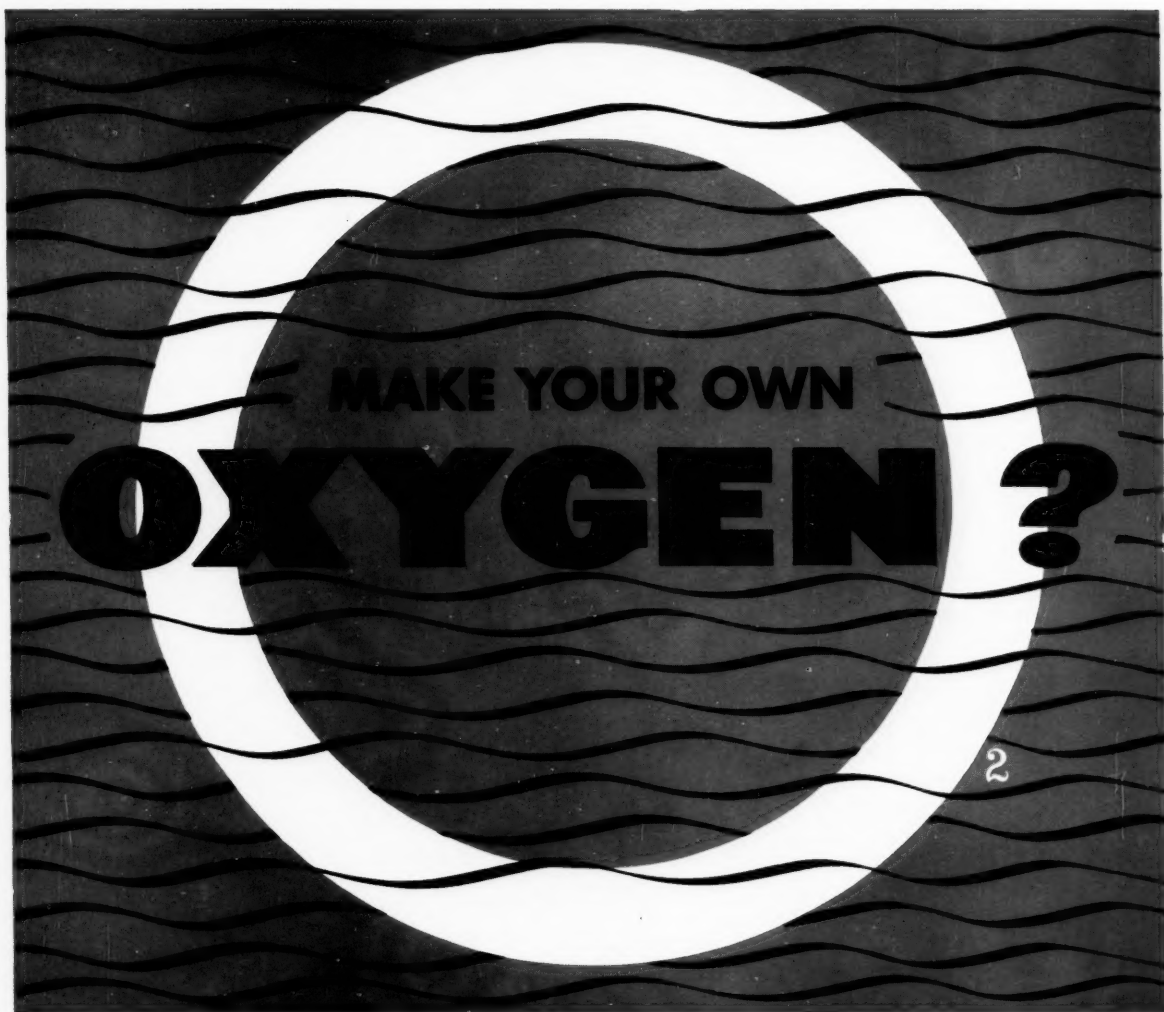
Canada's chemical imports hit \$288.6 million. They totaled some 11% higher than '55's \$260.5 million. Reason for the surge: Canadian industrial and economic expansion is progressing unabated, outstripping domestic supplies of certain chemicals. The country's total chemical exports in '56 were valued at \$228.6

million, approximately 9% higher than in '55.

The U.S. is still Canada's leading supplier of chemicals, shipped \$250.4 million worth in '56—86.8% of the Dominion's total chemical imports. In '55, the U.S. supplied 85.4% (\$222.6 million worth).

In '56, the U.S. absorbed well over 57% of total Canadian chemical exports, about \$130.8 million worth, compared with 53%, about \$111.7 million worth, in '55.





## Here's why you'll want to talk with **MESSER**

Do your oxygen needs justify an owned or leased oxygen plant?

Is it more practical for you to buy liquid or bottled oxygen from a reliable oxygen producer?

These questions can only be answered after a careful analysis of your situation is made. And that's why we say you should talk with Messer.

Because:

Messer sells outright or leases oxygen plants

to meet every need of the steel and chemical industry.

Messer is also a major supplier of the fast-growing oxygen producing industry.

So talk it over with Messer—no obligation—to make sure you get the best unbiased engineering advice.

Messer also designs plants to produce nitrogen and argon; in fact, everything for the cryogenic process field.

### **AMERICAN MESSER CORPORATION**

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"THERE IS NO SUBSTITUTE FOR MESSER EXPERIENCE"





# CARBIDE'S Morpholine *means*



## unsurpassed performance for rubless polishes

If you are making rubless polishes—whether they be tailored for the home, factory, or office—then you need Morpholine. Reasons why? Morpholine based rubless polishes dry quickly—fast enough in fact to allow traffic on the floor shortly after application.

When it comes to water resistance, rubless polishes based on this amine—by performance and rigid test—are unsurpassed. Our Technical Representative can show you data proving the value of Morpholine in giving fast dry and excellent water resistance to these polishes.

In addition to Morpholine, other chemicals from Union Carbide Chemicals Company, such as triethanolamine, dimethyl ethanolamine, and TERCITOL nonionic NPX are valuable in making various rubless polishes. Suggested formulations for these polishes are contained in the 92-page "Emulsions and Detergents" Booklet. This booklet also contains technical data and suggested formulations for "soluble" oils, solvent emulsions, wax emulsions, oil and wax polishes and detergents. You'll want a copy—it has helped others improve their products or find new avenues for profit.

In Canada, Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal.

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#### UNION CARBIDE CHEMICALS COMPANY

Room 328, 30 East 42nd Street, New York 17, New York

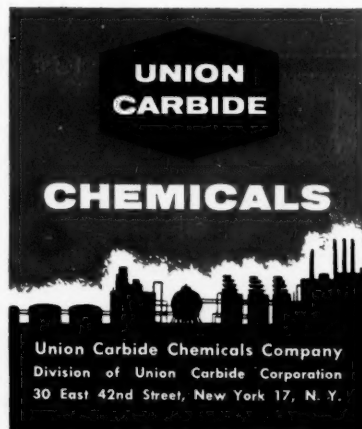
Please send me a copy of "Emulsions and Detergents."

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